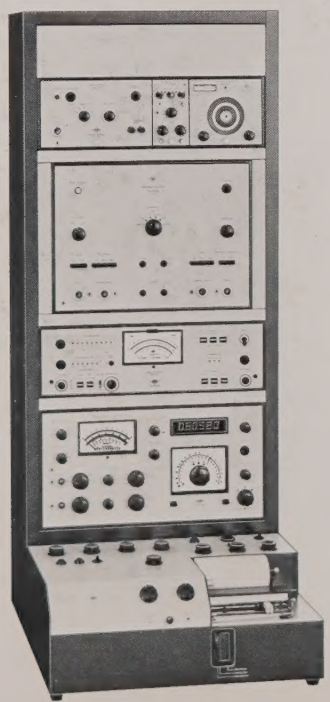
0351A62

KA, KK, KQ, KS

Instruction Manual

KA Carrying Cases, KK Modular Cassettes and Cabinets
KQ Rack Systems, KA 19-Inch Rack-System Adaptors



Virtually all B & K instruments are built in modular cassettes and cabinets whose dimensions enable them to be fitted simply and neatly into functional instrumentation set-ups, both portable and static. Standard mahogany carrying cases offering extra protection to the instruments are available, and a light-weight plastic carrying case is available for transporting combinations of the smaller portable instruments. B & K instruments may be fitted directly into any of the B & K rack systems, or into the 19-inch rack system using the flanges and mounting sets available.

033-0078

B K Brüel & Kjær

Digitized by the Internet Archive
in 2025

https://archive.org/details/manualsplus_09435

KA CARRYING CASES
KK MODULAR CASSETTES AND CABINETS
KQ RACK SYSTEMS
KS 19-INCH RACK SYSTEM ADAPTORS

Revision May 1980

CONTENTS

1. INTRODUCTION AND SPECIFICATIONS (PRODUCT DATA) 1

2. KA CARRYING CASES 5

2.1. GENERAL 5
2.2. ASSEMBLY OF INSTRUMENT INTO MAHOGANY CASE 5
2.3. PARTS LIST 8
2.4. PLASTIC CARRYING CASE KA 2000 8

3. KK MODULAR CASSETTE SYSTEM 11

3.1. GENERAL 11
3.2. ASSEMBLY OF MODULAR CASSETTES INTO FRAME KK 0014 (OR KK 0010) 12
3.3. ASSEMBLY OF BLANK PANELS ONTO FRAME KK 0014 (OR KK 0010) 13
3.4. FITTING THE MOUNTING FRAME INTO A MAHOGANY CASE 14
3.5. MOUNTING KK 0014 (OR KK 0010) INTO A 19-INCH RACK 15
3.6. KK 0014 PARTS LIST 15

4. KQ RACK SYSTEMS 16

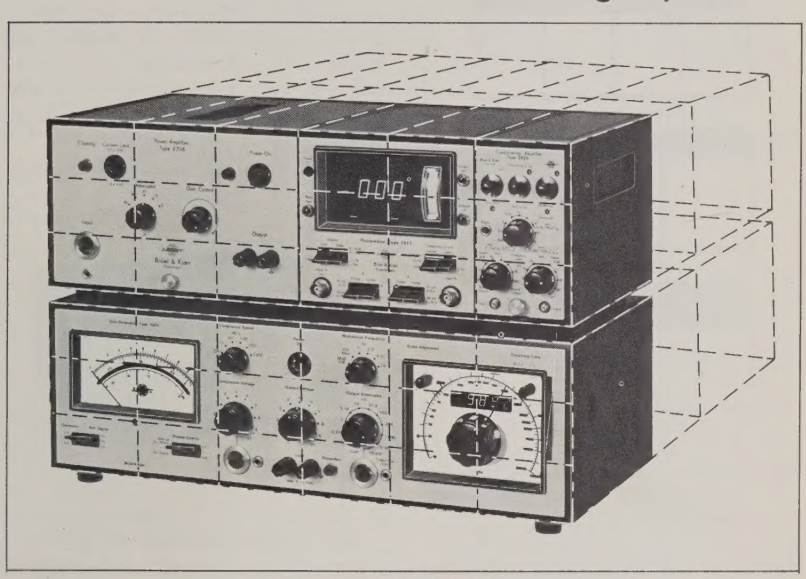
4.1. GENERAL 16
4.2. ASSEMBLY OF THE KQ RACK SYSTEM 16
4.3. MOUNTING THE LEVEL RECORDER TYPE 2305 23
4.4. MOUNTING THE LEVEL RECORDER TYPE 2307 24
4.5. MOUNTING CHAIN-DRIVE SPROCKETS ON THE LEVEL RECORDER 25
Use of DRIVE SHAFT I 25
Use of DRIVE SHAFT II 27
4.6. MOUNTING THE CHAIN TIGHTENER UT 0025 28
4.7. MOUNTING THE CHAIN-SPROCKET ASSEMBLY ON THE INSTRUMENT 29
4.8. THREADING THE DRIVE CHAIN 29
4.9. FINAL POINTS 31
4.10. PARTS LISTS 33

5. KS ADAPTORS TO 19-INCH RACK 35

5.1. GENERAL 35
5.2. MOUNTING FLANGES ON INSTRUMENTS 35
5.3. ASSEMBLY AND FITTING OF RACK-MOUNTING FRAMES 37
5.4. ATTACHING INSTRUMENTS TO THE 19-INCH RACK 37
Instruments with rack-mounting flanges or frames 27
Level Recorder Type 2305 38
Level Recorder Type 2307 39
5.5. USE OF THE CHAIN-DRIVE SYSTEM 40
5.6. FINAL POINTS 43
5.7. PARTS LISTS 43

KA, KK, KQ and KS

Cassette, Cabinet and Combining Systems



FEATURES:

- Modular dimensioning
- Tidy and functional instrument set-ups
- Easy service and inspection
- Single cassettes can be combined to form bigger units
- Simple mounting in protective mahogany boxes and carrying case for portable use

The B & K modular cabinets are based on the directions laid down in ANSI and DIN standards, the total width, however, being 430 mm in order to secure compatibility with all 19" rack systems. The cabinets are built-up of an extruded aluminium frame into which the bottom, side and top plates slide in grooves. This construction gives a very strong, light-weight cabinet with easy access for servicing.

The cabinets are available in three versions, the A version which is the standard metal cabinet, the B version which is the metal cabinet fitted into a protective mahogany cabinet and the C version which is the metal cabinet fitted with flanges which allows it to be mounted directly into a standard 19" rack.

The dimensions stipulated in the standards allow for a broad variety of cabinets, the system developed by B & K, however, does not contain cabinets according to all these dimensions but a certain selection has been carried out in order to make a system which has the flexibility necessary for the purpose.

The cabinets with the smallest height are available in five different widths. These cabinets can be set-up in different combinations in a 430 mm wide frame and as such form their own system, designated the Modular Cassette System.

Instruments built into the modular cabinet and cassette systems can be mounted in various combinations in the B & K Combining System, which is a set of four rack-type cabinets, each using a Level Recorder Type 2307 as the basic instrument. This Combining System also accepts instruments with a width of 380 mm according to an earlier B & K system.

For field measurements all 132,6 mm high cabinets and cassettes having a maximum depth of 200 mm can be inserted in a practical carrying case.

Modular Cassette System

The cassettes are all 132,6 mm high and 200 mm deep. Five different widths are available, corresponding to 1, 2, 3, 4 and 6 modular units. The width of one modular unit is 34,5 mm plus 0,5 mm spacing, this corresponds to 1/12 the width of the common Combining Frame KK 0014 available. (For dimensions of the individual cassettes, see table on the back page). The Combining Frame allows, as can be seen from Fig.1, a very flexible mechanical system build-up, as it will accept 44 different combinations of cassettes.

The combining frame with cassettes may be used alone (A version), inserted in a wooden cabinet with lid for portable use (B version) or be fitted with simple flanges for 19" rack mounting (C version). Finally it can also be inserted in the B & K Combining System described

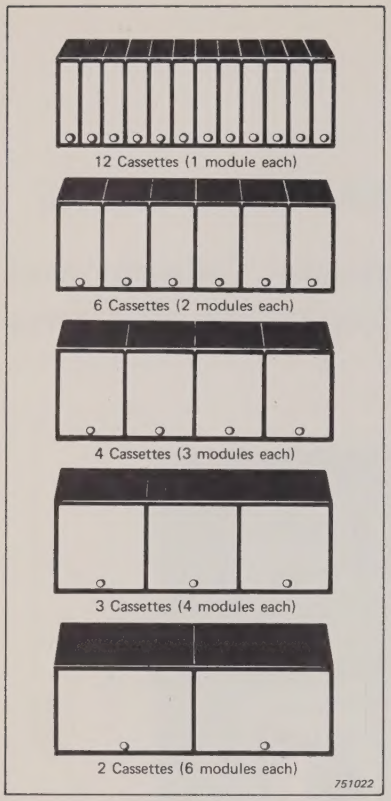

12 Cassettes (1 module each)
6 Cassettes (2 modules each)
4 Cassettes (3 modules each)
3 Cassettes (4 modules each)
2 Cassettes (6 modules each)
751022

Fig.1. Modular Cassettes which can be mounted in the 430 mm wide combining frame KK 0014

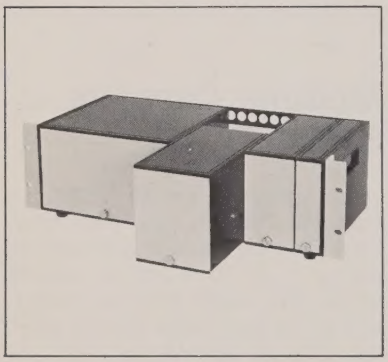


Fig.2. Example of cassettes mounted in the mounting frame KK 0014

later. If the mounted cassettes do not fill the KK 0014 frame out completely, blank panels are available for filling the gap.

Some earlier B & K modular units do not directly fit the KK 0014 frame as they are narrower than the present ones. They can, however, be assembled together in the frame KK 0010. Also in this case blank panels are available to make up a neat front panel appearance.

Modular Cabinet System

The modular cabinets come in five different heights and three different depths, all 430 mm wide.

All cabinets in the system may be used alone (A version) and are then fitted with rubber feet and flush mounted handles in the top plate as shown in Fig.3. For transportation purposes, protective mahogany boxes are available (B version) as shown in Fig.4. and for rack mounting, flanges can be fitted to the front frame as shown in Fig.5 (C version).

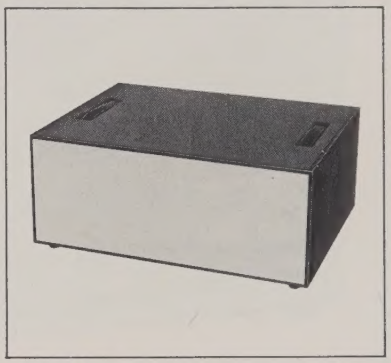


Fig.3. Standard metal cabinet (A version)

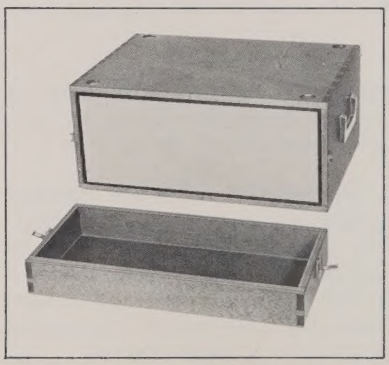


Fig.4. Standard metal cabinet in protective mahogany cabinet (B version)

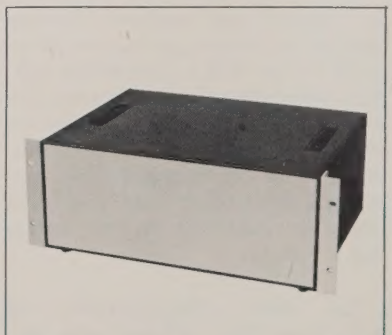


Fig.5. Standard metal cabinet mounted with flanges for rack mounting (C version)

Instrument Combining System

This combining system offers a wide selection of possibilities for combining standard instruments with the Level Recorder Type 2307 as the basic instrument. When mounted in the combining system, the generators, frequency analyzers and filters in the B & K programme of instruments can be automatically frequency scanned, electrically or mechanically, controlled from the Level Recorder. This provides neat, compact set-ups for automatic recording of frequency analyses, frequency response curves, reverberation decay curves etc. on frequency calibrated paper. As can be seen from the table in the specifications, the system consists of 4 Combining Units of different heights, and blank panels, separating shelves, mounting sets and chain drive assemblies which, depending on the choice of instruments, should be ordered separately.

The Combining Units accept instruments having a maximum depth of 200 mm and both the earlier 380 mm wide instruments and the present 430 mm wide instruments as well as instruments in Modular Cassettes mounted in a KK 0014 combining frame (see description of Modular Cassette System).

To find a suitable cabinet and the necessary accessories for a particular instrument combination, use the table as follows:

Find the instruments in the left hand column. Go to the right where the necessary Mounting Sets and Chain Drives are found in the second and third columns. In the fourth column, the heights of the instruments can be seen. If the selected instruments have the same height, proceed to the right in the table opposite that instrument height until you arrive at the **first** column containing the required number of instruments. You can now read the Combining Unit Type No. at the top of the table and the necessary number of Separation Shelves and the Blank Panel order No. at the bottom. If the selected instruments have different heights, proceed to the right in the table op-

posite the heights of all the required instruments until you arrive at the **first** vertical column containing the required number of instruments for each height. Find the order numbers as described above.

Fig.6. Combining Unit KQ 0118 with instruments

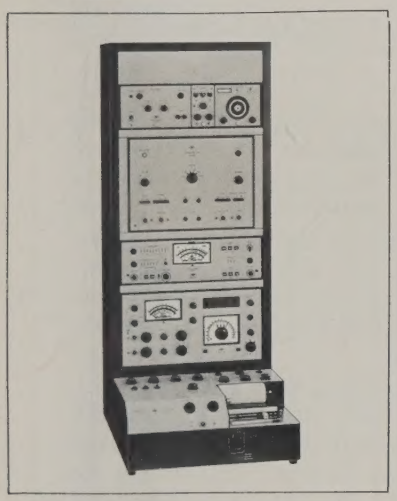


Fig.7. Combining unit KQ 0121 with instruments

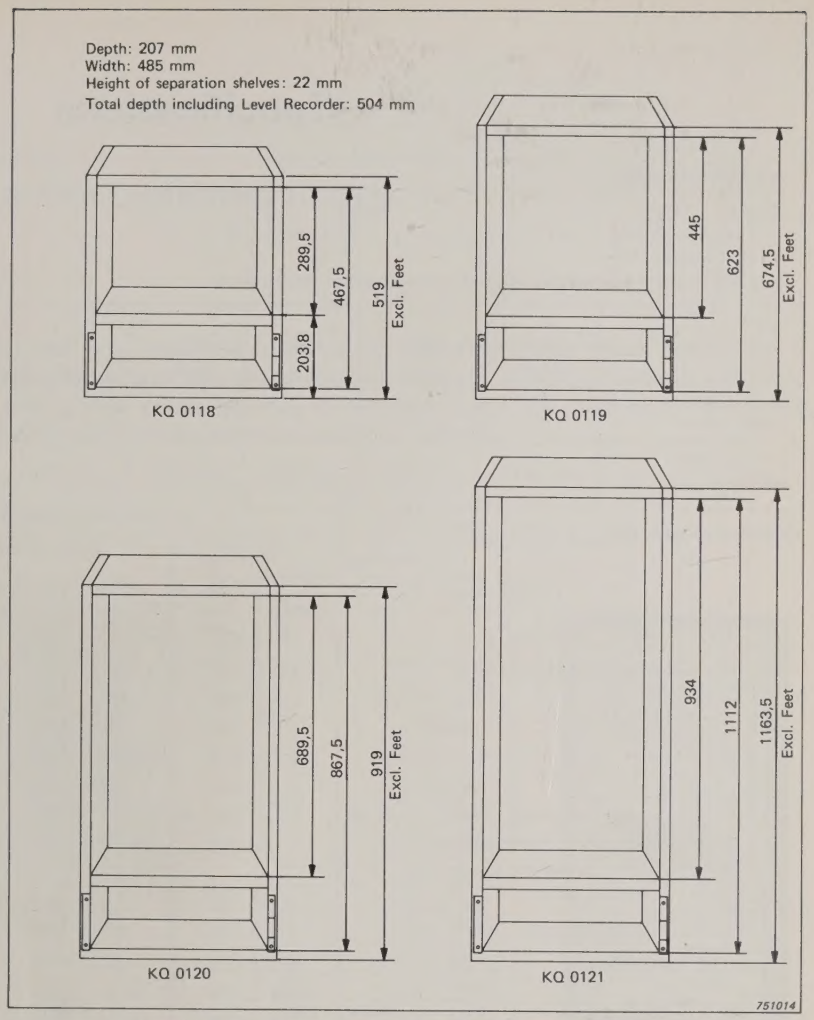


Fig.8. The main dimensions of the four combining units

Carrying Case

For easy and safe transportation of one or more instruments, when measurements must be made under field conditions, the Carrying Case KA 2000 is available. It can accomodate various combinations of the instruments housed in Modular Cassettes (maximum 12/12) as well as single instruments made to fit into 19" rack systems and having a height of 132,6 mm and depth of 200 mm.

It is made of hard foam plastic, and is fitted with a removeable transparent lid and a handle that can be swung through 90° to act as a foot, tilting the instruments up for better viewing.

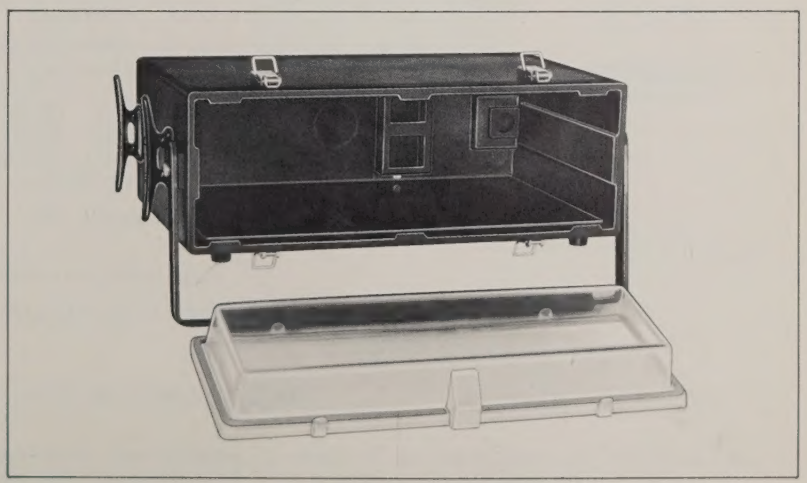


Fig.9. Carrying Case KA 2000

Specifications

CASSETTE SYSTEM

Height:
132,6 mm (5,2 in)
excl. of rubber feet

Depth:
200 mm (7,9 in)

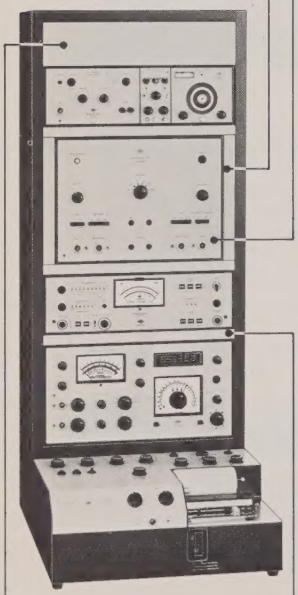
Type Nos. of blank panel sets corresponding to the various module units

Width mm (in)	34,5 (1,4)	69,5 (2,7)	104,5 (4,1)	139,5 (5,5)	209,5 (8,3)
Number of module units	1	2	3	4	6
Corresp. blank panel set	UA 0366	UA 0367	UA 0368	UA 0369	UA 0370

Combining Frame order No. (A and C versions): KK 0014
Contains flanges and all necessary fittings for 19" Rack mounting
For combination of cassettes to a total width of 430 mm (12 units = 420 mm plus 5 mm on either side for KK 0014)
Height: 132,6 mm. Depth: 206 mm

Mahogany Cabinet order No. (B version): KA 0027
For protection of KK 0014 with cassettes for portable use

COMBINING SYSTEM



* 4 screws YV 3327 M3 x 10 required

• Only if mechanical drive of other instruments is necessary

Instrument Type No.	Mounting Set including side fillers	Chain Drive Assembly	Height of Instruments (mm)	Number of various instruments containable in Combining Unit. Order No. KQ 0118 Ext. Height 519 mm				KQ 0119 Ext. Height 674,5 mm			KQ 0120 Ext. Height 919 mm						KQ 0121 Ext. Height 1163,5 mm						
1023	–	UT 0024																					
1526	–	–																					
1544/45	–	–																					
1617/18	–	–																					
1901	–	–																					
1902	UA 0489	–	132,6 →			1	2	1	1	3			1	1	2	2	4		2	2	3	4	4	5
2610/36	–	–																					
2712	–	–																					
2713	–	–																					
2811	–	–																					
4417	–	–																					
4429	–	–																					
4911	UA 0489	–																					
6302	–	–																					
KK 0014	*	–																					
1027	–	UT 0024	221,5 →		1				1					1		1				1			1	
2020	UA 0490	–	280 →	1				1				2		1	1			1		1	1	1		
2120	UA 0490	UT 0014																					
2010	UA 0492	UT 0014	480 →								1		1					1	1					
2305	UA 0507	UT 0026•	177 →	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2307	–	UT 0027•																						
Separation Shelves, quantity reqd. Order No. KS 0037						1	1	1	2		1		2	2	2	3	1	2	3	3	4	4	4
Blank Panel Order No. (1 required)				FA 0559	FA 0555	FA 0557		FA 0559	FA 0555		FA 0569	FA 0564	FA 0561	FA 0559	FA 0563	FA 0557	FA 0556	FA 0566	FA 0565	FA 0563	FA 0568	FA 0560	FA 0556	FA 0558

For instrument combinations requiring remote control cables please refer to separate data sheet on Connectors and Cables.

790885/1

2. KA CARRYING CASES

2.1. GENERAL

For additional protection of instruments (particularly useful for those which are regularly transported, for example), a selection of mahogany cases of different sizes for different instruments (and instrument combinations) is available with KA numbers. These KA numbers are listed with the instrument dimensions in Table 2.1.

Mahogany Case No.	Instrument Dimensions			Instrument Types*
	Height mm (in)	Width mm (in)	Depth mm (in)	
KA 0010	480 (18,9)	380 (15)	200 (7,9)	2010 (1013, 1017, 1022, 1024, 2107)
KA 0012	280 (11)	380 (15)	200 (7,9)	2020, 2120 (1614, 1615)
KA 0019	132,6 (5,2)	380 (15)	200 (7,9)	4911
KA 0020	132,6 (5,2)	380 (15)	200 (7,9)	KK 0010
KA 0023	180 (7,1)	480 (18,9)	290 (11,4)	2307
KA 0025	280 (11)	380 (15)	140 (5,5)	(2007)
KA 0026	132,6 (5,2)	380 (15)	200 (7,9)	1902, 2607 (2606, 2608)
KA 0027	132,6 (5,2)	430 (16,9)	200 (7,9)	1526, 1544, 1545, 1901, 2811, 4429, 6302, 7400, KK 0014
KA 0028	130 (5,1)	120 (4,7)	200 (7,9)	(2510)
KA 0029	380 (15)	380 (15)	200 (7,9)	(1402, 2113, 2114, 2603)
KA 0031	380 (15)	380 (15)	350 (13,8)	(2130, 4710)
KA 0032	177 (7)	430 (16,9)	500 (19,7)	(2021)
KA 0033	177 (7)	430 (16,9)	500 (19,7)	2707
KA 0035	177 (7)	430 (16,9)	320 (12,6)	1047
KA 0037	132,6 (5,2)	209,5 (8,3)	200(7,9)	(4423)
KA 0040	177 (7)	430 (16,9)	500 (19,7)	7502
KA 0041	132,6 (5,2)	139,5 (5,5)	200 (7,9)	1621, 2425, 2426, 2427, 2429, 2609, 2650, 2971, 4291, 4416, 5586 (5619)
KA 0055	132,6 (5,2)	209,5 (8,3)	200 (7,9)	2511
KA 0056	221,5 (8,7)	430 (16,9)	200 (7,9)	1027
KA 0057	132,6 (5,2)	380 (15)	200 (7,9)	4143
KA 0059	132,6 (5,2)	430 (16,9)	200 (7,9)	1023, 1617, 1618, 2610, 2636, 2712, 2713, 4417
KA 0060	280 (11)	380 (15)	200 (7,9)	(2121)
KA 0062	177 (7)	430 (16,9)	320 (12,6)	7507
KA 0063	132,6 (5,2)	209,5 (8,3)	200 (7,9)	2512
KA 2305	180 (7,1)	480 (18,9)	290 (11,4)	(2305)

760006.1

* Parentheses in this column indicate suitable earlier Instrument Types

Table 2.1. Numbers and dimensions of mahogany cases

2.2. ASSEMBLY OF INSTRUMENT INTO MAHOGANY CASE

The assembly principle for instruments in cases of earlier design is shown in Fig.2.1. The assembly procedure is as follows:

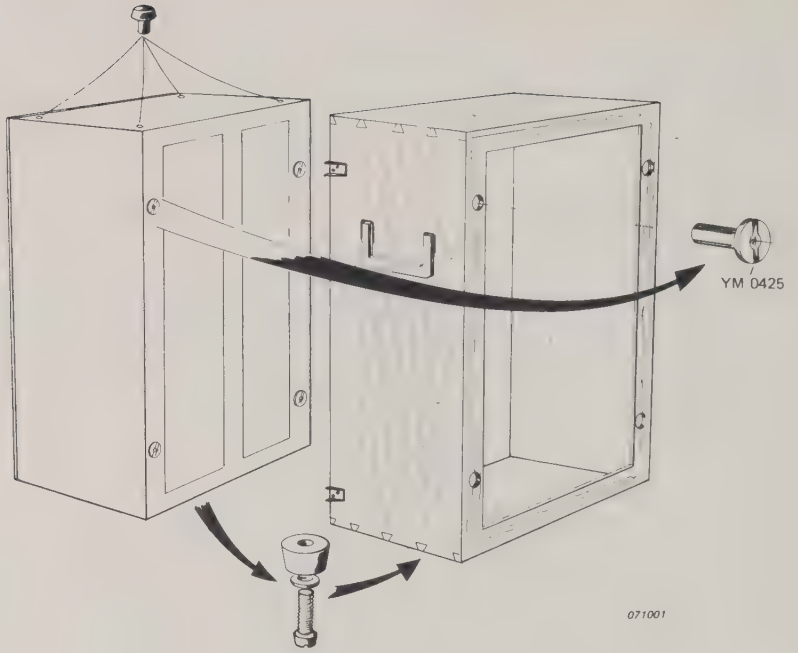


Fig.2.1. Mounting earlier instrument into mahogany case

1. Remove the plastic location pegs from the top of the instrument, the rubber feet, and the bushes which secure the black metal case.

2. Taking care that the instrument and the black metal case are not separated, the two should be inserted into the mahogany case (see Fig.2.1).

3. Refit the securing bushes, but do not tighten at this stage.

4. Refit the rubber feet using the longer bolts supplied with the mahogany case, and tighten all the bolts (see Fig.2.2).

The assembly principle for newer instruments is shown in Fig.2.3. The assembly procedure is as follows:

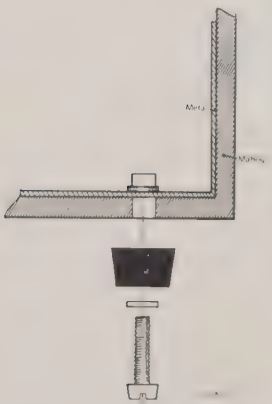


Fig.2.2. Refitting feet onto mahogany case

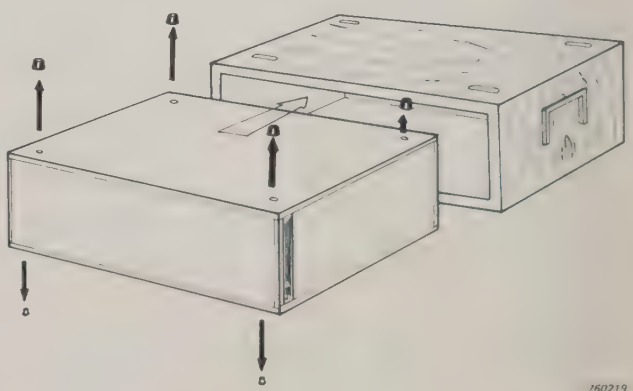


Fig.2.3. Mounting newer instrument into mahogany case

1. Remove the plastic location pegs from the top of the instrument, and the plastic feet (see Fig.2.3).

2. Insert the instrument into the mahogany case, and turn the whole upside-down (see Fig.2.3).

3. Screw the 4 adaptors (YG 0160) through the holes in the mahogany case into the base of the instrument (see Fig.2.4).

4. Refit the plastic feet, bolting them onto the adaptors.

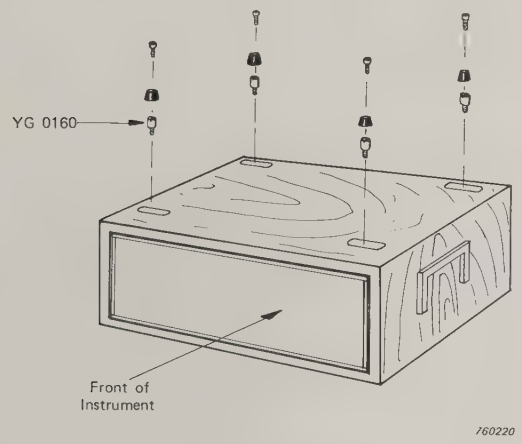


Fig.2.4. Refitting feet onto mahogany case

2.3. PARTS LIST

Mahogany Case No.	Instrument Fixing	Bolts for Rubber Feet	Other parts included
KA 0010	Bushes on instrument backplate	4 x YV 3496	
KA 0012	Bushes on instrument backplate	4 x YV 3496	
KA 0019	Fixed by feet only	2 x YV 3335 (front 2 x YV 3336 (back)	
KA 0020	Fixed by feet only	4 x YV 3336	
KA 0023	Fixed by feet only	Original Bolts	
KA 0025	Bushes on instrument backplate	4 x YV 3335	
KA 0026	Bushes on instrument backplate	2 x YV 3335 (front) 2 x YV 3336 (back)	
KA 0027	4 x YG 0160	Original Bolts	
KA 0028	Baseplate of instrument	2 x YV 3335 (front) 2 x YV 3336 (back)	
KA 0029	Bushes on instrument backplate	4 x YV 3457	
KA 0031	Bushes on instrument backplate	4 x YV 3496	
KA 0032	Fixed by feet only	4 x YV 3336	
KA 0033	Fixed by feet only	4 x YV 3336	
KA 0035	4 x YG 0160	Original Bolts	
KA 0037	Fixed to plate in bottom of case by front-panel thumbscrew	Included in KA 0037	Tilt stand
KA 0040	4 x YG 0160	Original Bolts	
KA 0041	Baseplate of instrument	4 x YV 3335 (front and back) or 2 x YV 3333 (front)	
KA 0055	Fixed to plate in bottom of case by front-panel thumbscrew	Included in KA 0055	Tilt stand
KA 0056	4 x YG 0160	Original Bolts	
KA 0057	Bushes on instrument backplate	4 x YV 3335	
KA 0058	4 x YG 0160	Original Bolts	
KA 0059	4 x YG 0160	Original Bolts	
KA 0060	Bushes on instrument backplate	2 x YV 3335 (back) 2 x YV 3333 (front)	
KA 2305	Fixed by feet only	Original Bolts	

760007 1

Table 2.2. Lists the assembly parts supplied with the mahogany cases

2.4. PLASTIC CARRYING CASE KA 2000

As this case is rather different from the others, details of its assembly and of fitting instruments into it are given here for completeness. It is a robust hard-foam plastic case which can contain up to 12 of the 34,5 mm wide modular cassettes, see section 3.1. It can also hold any instrument which will fit into mahogany case KA 0027. It is lightweight, and is fitted with a transparent plastic cover, so is ideally suited for use in the field. Fig.2.5 shows an exploded view of the case and some typical instrument fittings. The procedure for assembly is as follows:

1. Detach the metal plate GU 1088 from the case by removing the 4 bolts YS 0397 through the plastic feet, noting which way up it was fitted.

2. Remove the baseplates of the instruments to be fitted by turning the thumbscrews at the bottom centres of their front panels anticlockwise and sliding their baseplates off towards the rear. Care should be taken not to damage the instruments with their baseplates removed.

3. Detach the feet (and metal stands if fitted) from the baseplates by removing the nuts and bolts which retain them.

4. Bolt the baseplates onto the upper side of the metal plate GU 1088 in the required positions using 4 bolts YV 3322 for each one.

5. If other accessories, such as an accelerometer box holder DZ 9302, are required, they should also be attached at this stage, using the same type of bolts YV 3322.

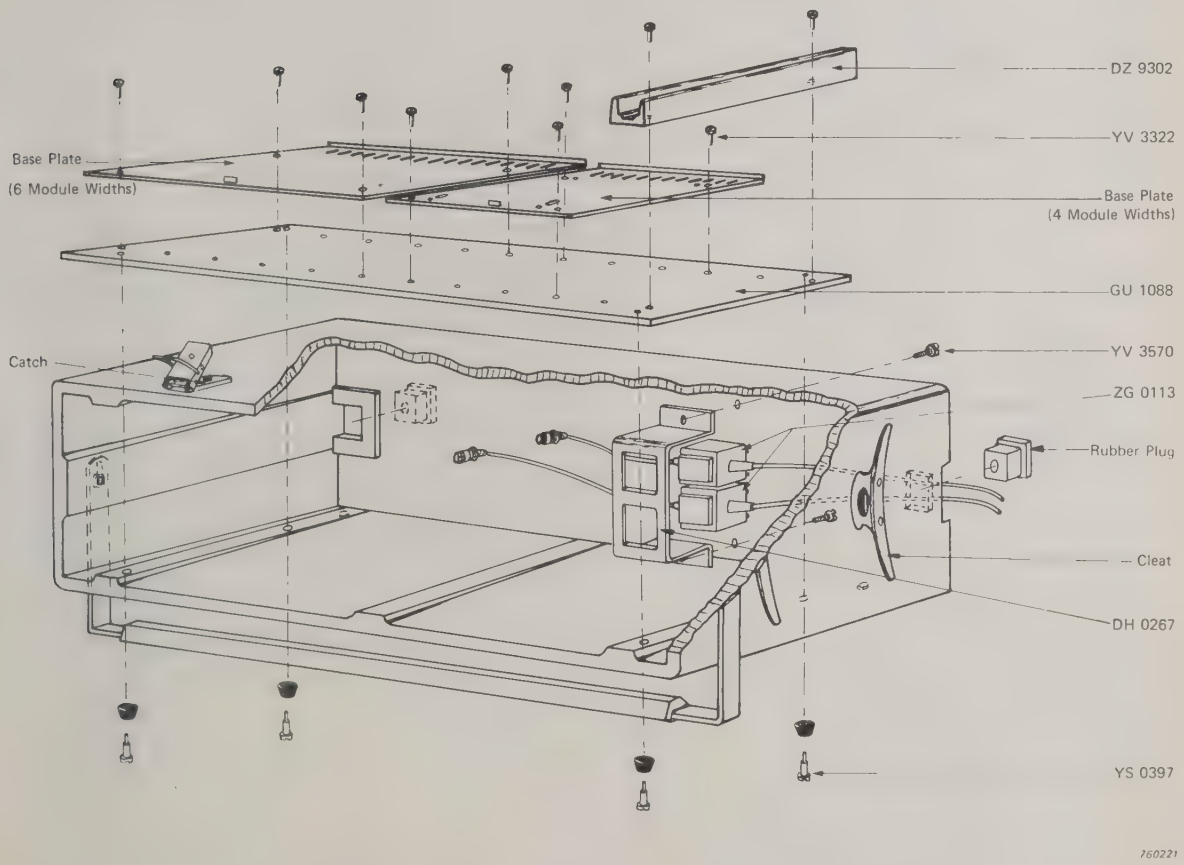


Fig.2.5. Exploded view of plastic case KA 2000 and typical instrument fittings

6. Provision is also made for attaching 2 Battery Chargers ZG 0113 into the case. (If these are not required, go to step 9.) Push the two bolts YV 3570 into the recesses in the rear of the case, and force them right through, as shown in Fig.2.6. If necessary, use a sharp instrument to pierce the casing.

7. Arrange the two Battery Chargers so that the raised squares on their upper surfaces fit into the holes of the bracket DH 0267. Holding the bracket against the inside of the rear of the case, bolt it in position. (See Figs.2.5 and 2.6.)

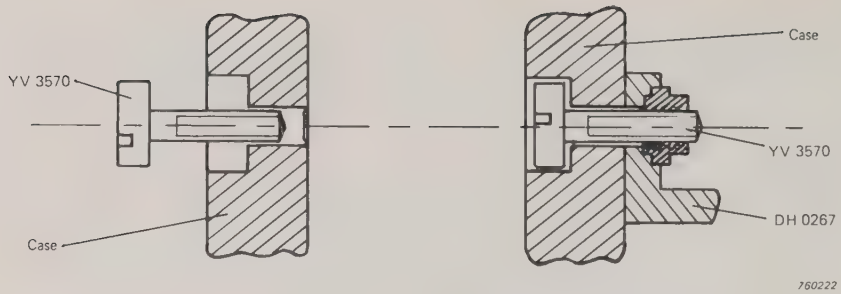


Fig.2.6. Insertion of bolts into rear of KA 2000

8. Run the mains supply cables for the Battery Chargers out through the hole in the rear of the case (having removed the rubber plug on the right), and wind them around the cleats.

9. Replace the metal plate GU 1088 with its attachments into the case, and secure it in position with the four bolts YS 0397 through the plastic feet.

10. Make any necessary switch adjustments and cable connections to the rear panels of the instruments.

11. Carefully slide the instruments back onto their baseplates, and secure them by turning their thumbscrews clockwise. **Ensure that the instruments are properly located and their catches correctly locked** by pulling their thumbscrews.

12. Put the transparent front cover on, and lock it in position with the 4 catches.

The KA 2000 Carrying Case is supplied complete with transparent cover, carrying handle, cleats, metal plate, rubber plugs, feet, and 25 bolts YV 3322 for instrument attachment. If the Carrying Case is supplied as part of the Portable Vibration Analyzer Type 3513, then the accelerometer box holder DZ 9302, the Battery Chargers ZG 0113, bracket DH 0267 and bolts YV 3570 are also supplied; otherwise, these accessories must ordered separately.

3. KK MODULAR CASSETTE SYSTEM

3.1. GENERAL

Some of the smaller B & K instruments are housed in modular cassettes whose sizes are selected so that several modules may be mounted together into a mounting frame KK 0014. The KK 0014 frame is supplied with a rack-mounting flange kit (KS 0022) for mounting it into a 19-inch rack. The KK 0014 frame will accept up to 12 modular cassettes, each of 34,5 mm (1,36 in) width, with a space of 0,5 mm (0,02 in) between each one. The width of each instrument is thus: (n × 35 mm) — 0,5 mm, as shown in Table 3.1. If less than 12 modular units are used, the full width of the frame may be used by inserting various blank panels, whose sizes and type numbers are also shown in Table 3.1.

Height : 132,6 mm (5,23 in) without feet			Depth : 200 mm (7,88 in)		
Number of Module Units (n)	1	2	3	4	6
Width mm (in)	34,5 (1,36)	69,5 (2,74)	104,5 (4,12)	139,5 (5,50)	209,5 (8,26)
Modular Cassette Number	KK 0021	KK 0022	KK 0023	KK 0024	KK 0025
Blank Panel Set No. (same width)	UA 0366	UA 0367	UA 0368	UA 0369	UA 0370
Typical Instrument Types	2651, 5743, 5767 (WH 0421)	2626, 2635, 2804, 2805 2807, 5516, 5596, 5767 (WH 0422) 6202	2638, 4714	1100, 1621 (WH 0276) 1621, 2425, 2426, 2427, 2429, 2609, 2650, 2971, 4291, 4416, 5586, 5685, 6203	1405, 1623, 2312, 2511, 2512, 2706, 2970, 2972, 4205, 4426, 4440, 5623, 5696, 5800

760008 1

Table 3.1. Sizes of modular cassettes and corresponding blank panels

Earlier B & K modular cassettes do not conveniently fit into the KK 0014 frame, but these may be assembled into the frame KK 0010. The KK 0010 is supplied with a rack-mounting flange kit (KS 0029) for mounting it into a 19-inch rack. The KK 0010 will accept up to 12 modular cassettes, each of 30,3 mm (1,19 in) width, with a space of 0,5 mm (0,02 in) between each one. The width of these earlier cassettes is thus; (n × 30,8 mm) — 0,5 mm; and blank panels are available to make up a neat front-panel appearance. These instrument sizes and blank panels are listed in Table 3.2.

Height : 132,6 mm (5,23 in) without feet			Depth : 200 mm (7,88 in)		
Number of Module Units (n)	1	2	3	4	6
Width mm (in)	30,3 (1,19)	61,1 (2,41)	91,9 (3,62)	122,7 (4,84)	184,3 (7,26)
Blank Panel Set No. (same width)	UA 0371	UA 0372	UA 0373	UA 0374	UA 0375

Most instruments which were originally produced in modules of these widths are now produced in the present (wider) sizes

760009

Table 3.2. Sizes of earlier cassettes and corresponding blank panels

3.2. ASSEMBLY OF MODULAR CASSETTES INTO FRAME KK 0014 (OR KK 0010)

The principle of mounting the modular cassettes is the same for both sizes, and only the procedure for mounting the newer ones (34,5 mm wide) into their frame (KK 0014) will be dealt with specifically, as follows:

1. Remove the baseplate from each instrument to be mounted by turning the thumbscrew at the bottom centre of its front panel anticlockwise until the locking catch is released (one turn should normally be enough) and sliding the baseplate off rearwards, as shown in Fig.3.1. Care should be taken not to damage the instruments with their baseplates removed.

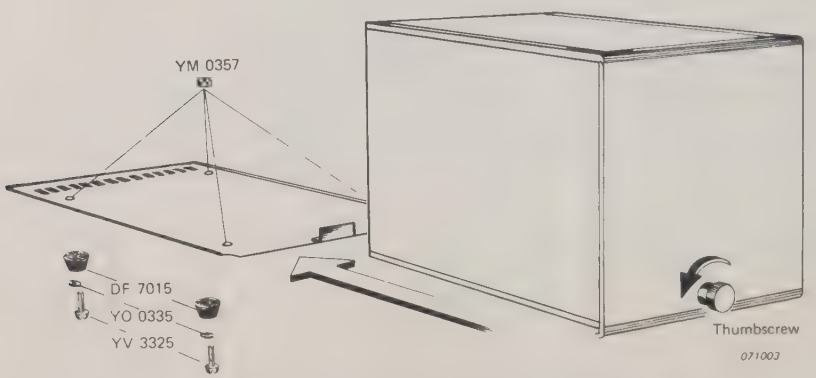


Fig.3.1. Removal of baseplate from modular cassette

2. Remove the feet from each baseplate by removing the nuts and bolts which retain them. Type numbers are shown in Fig.3.1; the only exception is the single-module instrument, which has only two feet (part number DF 7016) which are mounted with bolts (part number YV 3324) and nuts (part number YM 0357).

3. Fasten the baseplate of each instrument to the base of the mounting frame using the 3 mm thread × 4 mm long bolts (YV 3322) provided (see Fig.3.2).

4. When all the baseplates have been mounted as required, each instrument may be carefully slid back onto its own baseplate, and fastened in position by turning the thumbscrew clockwise (see Fig.3.3). **Ensure that the instruments are properly located and their catches correctly locked** by pulling the thumbscrew.

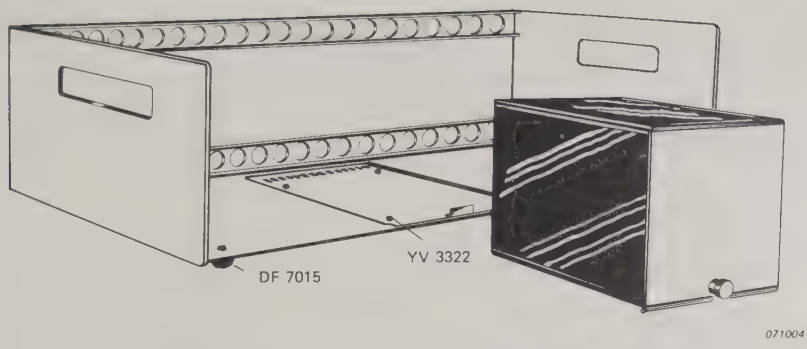


Fig.3.2. Fitting baseplate to mounting frame

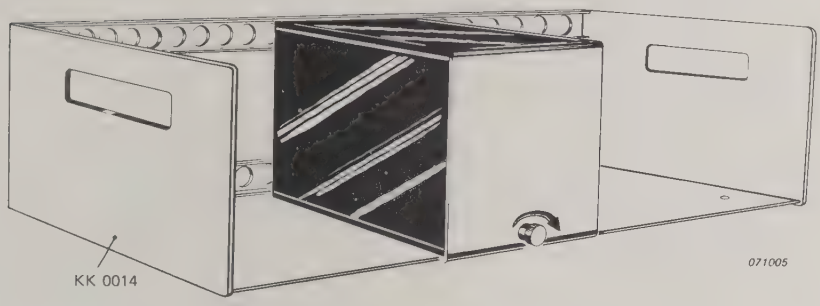


Fig.3.3. Fixing modular cassette to mounting frame

3.3. ASSEMBLY OF BLANK PANELS ONTO FRAME KK 0014 (OR KK 0010)

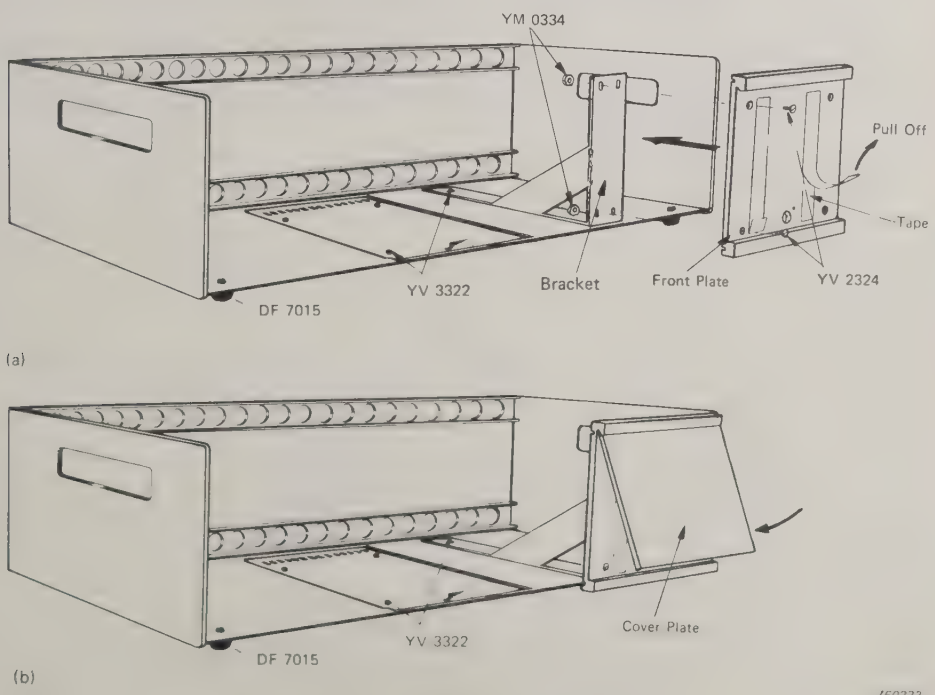


Fig.3.4. Fitting blank panel to mounting frame

The principle of mounting the blank panels is the same for each frame, and is similar for each size of blank panel, and the procedure is as follows:

1. Mount the bracket into the frame in the required position, using the YV 3322 bolts supplied (see Fig.3.4), but do not tighten the bolts at this stage.

2. Attach the front plate to the bracket, using the nuts and bolts provided (see Fig.3.4(a)).

3. Adjust the position of the bracket (using the elongated holes) until the front panel is in the correct position relative to the instruments, and then tighten the bolts.

4. Pull off the cover strip from the adhesive tape on the front plate and fit the cover plate by pushing it upwards into the groove and then pressing it fully home (see Fig.3.4(b)).

3.4. FITTING THE MOUNTING FRAME INTO A MAHOGANY CASE

As with the larger B & K instruments, modular instruments fitted into the mounting frames KK 0014 (or KK 0010) may be further protected by fitting them into mahogany cases KA 0027 (or KA 0020 for the KK 0010). The mounting frame, complete with modular instruments, is inserted into the mahogany case as shown in Fig.3.5. The procedure is as follows:

1. Remove the feet from the KK 0014 (or KK 0010), and slide the frame and instrument into the mahogany case.

2. Screw the 4 adaptors YG 0160 (supplied with the mahogany case) through the holes in the bottom of the mahogany case into the baseplate of the KK 0014, but not for the KK 0010.

3. Bolt the 4 feet from the KK 0014 into the tapped holes in the adaptors YG 0160. Bolt the 4 feet from the KK 0010 through the holes in the bottom of the mahogany case into the baseplate of the KK 0010 by means of the bolts YV 3336 supplied with the KA 0020.

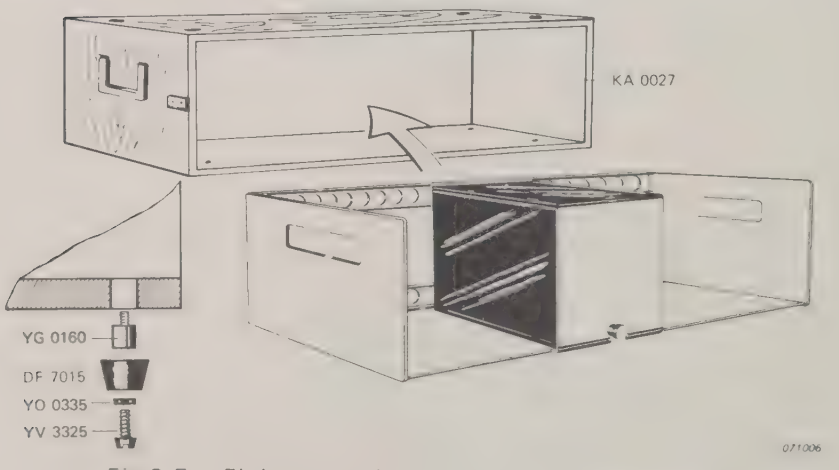


Fig.3.5. Fitting mounting frame into mahogany case

3.5. MOUNTING KK 0014 (OR KK 0010) INTO A 19-INCH RACK

The mounting set KS 0022 (or KS 0029) enables the KK 0014 (or KK 0010) mounting frame to be mounted into a 19-inch rack. The flanges should be fitted onto the mounting frame before the instruments are replaced onto their baseplates. The procedure for fitting the flanges is clearly shown in Fig.3.6.

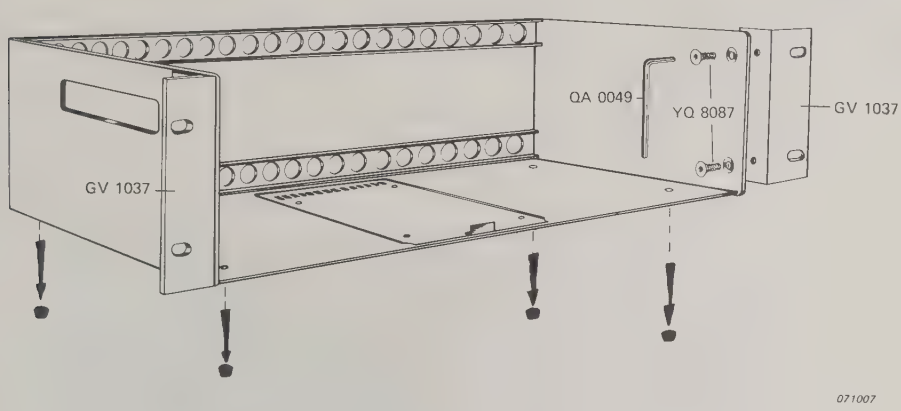


Fig.3.6. Fitting rack-mounting flanges to mounting frame

3.6. KK 0014 PARTS LIST

The following parts are supplied with the KK 0014:

25 × YV 3322	Bolts (instrument baseplate mounting)	
4 × YQ 8087	Allen screw (flange mounting)	KS 0022
1 × QA 0049	Allen key	KS 0022
2 × GV 1037	Flanges	KS 0022

A similar kit is provided with the KK 0010, the only difference being the flanges.

3.7. MOUNTING FRAME KK 0042

The Mounting Frame KK 0042, shown in Fig.3.7, can be used when longer instruments (up to 250 mm in depth) are to be fitted into a 19-inch rack.

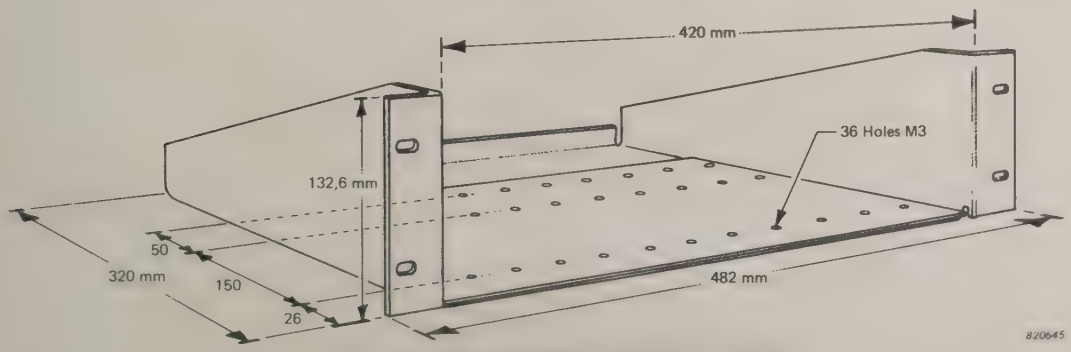


Fig. 3.7. The Mounting Frame KK 0042.

4. KQ RACK SYSTEMS

4.1. GENERAL

Another rack system has been introduced, which comes in 4 basic units, KQ 0118, KQ 0119, KQ 0120 and KQ 0121 (see Fig.8 of Chapter 1). All these units accept instruments up to 430 mm (16,9 in) width and 200 mm (7,9 in) depth, and a 2305 or 2307 Level Recorder of width 482 mm (18,9 in) attached to the front. The lower shelf (see Fig.8 of Chapter 1) is in such a position that its lower edge fits flush with the top of the Level Recorder. Other shelves may be fitted in at any required height (continuously adjustable) to suit a variety of instrument combinations. Blank panels are available to fill in spaces at the sides of narrower instruments, and above (and/or below) the instruments if necessary. The sizes, and the method of selection, of these panels are given in Chapter 1. (It should be noted that the list of instrument combinations given in the last Table of Chapter 1 is not complete — there are many more combinations possible.) As with the earlier rack system, it is still possible to use a chain drive from the Level Recorder to any Analyzer, Generator, etc., mounted in the rack system. The necessary kits are also shown in the last Table of Chapter 1.

In the following sections, instructions for the assembly of these KQ racks are detailed. (Those customers with the earlier system will already have an Instruction Manual for them, so they will not be covered here.) Individual fixing screws and other components are identified as they are required in the assembly process, but before commencing it is advisable to check that all the required parts are available. Lists of components and accessories for each KQ rack are given in section 4.10.

4.2. ASSEMBLY OF THE KQ RACK SYSTEM

The method of construction and assembly for each of the 4 different units available is identical, and so only one such assembly will be detailed. The assembly procedure, including the fitting of different types of instruments onto the shelves, is as follows:

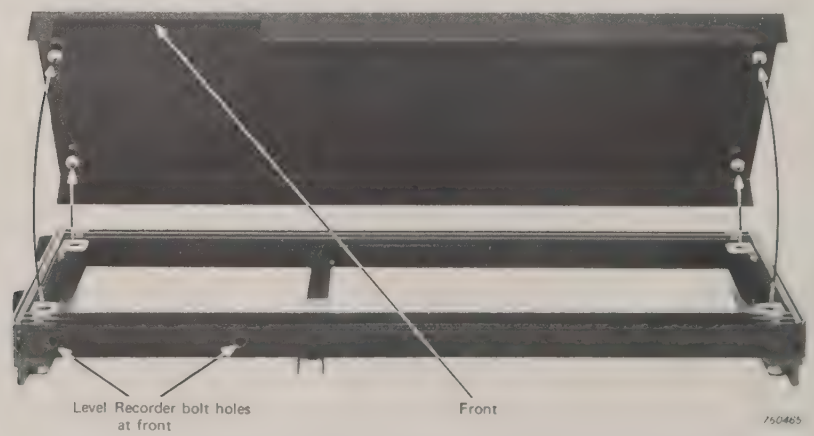


Fig.4.1. Removal of cover plate from side chassis member

1. Remove both the cover panels from the side chassis members (if fitted) by turning the 8 snap-locking screws anticlockwise until they "click" (about half a turn), and sliding the panels off. (See Fig.4.1.)

2. Attach the top and bottom chassis members to the side chassis members using the 16 allen screws (4 in each corner) and allen key supplied. (See Fig.4.2.) Ensure that the components are assembled the correct way round: the bolt holes for Level Recorder attachment should be at the front of the side members, with the cut-out for the chain drive on the right (viewed from the front); the cut-out for the Level Recorder power socket should be to the front of the bottom member; and the two small bolt holes in the top and bottom members should be to the rear.

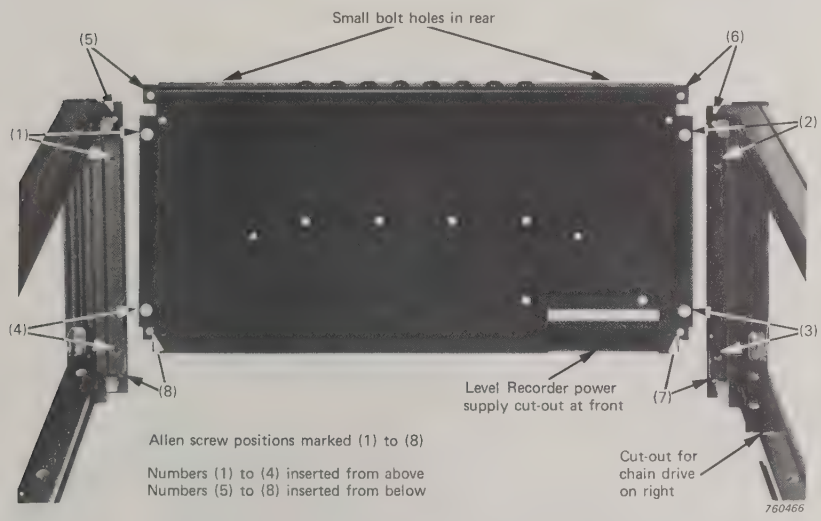


Fig.4.2. Assembly of chassis members

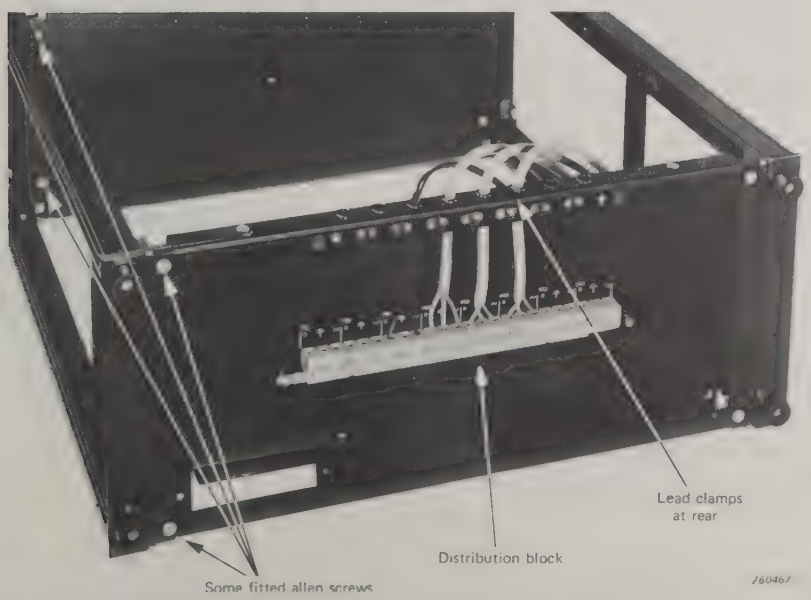


Fig.4.3. Assembled chassis showing electrical distribution block and lead clamps

3. Turn the assembly upside down, loosen the clamps, and run each lead to be used through the holes in the rear of the bottom chassis member. Connect one mains lead (3 terminals) for each instrument to be used in the rack system to one set of 3 terminals on the distribution block, observing the colour coding. The connections are shown in Fig.4.3, which also shows the 2-terminal connection necessary for instruments without a ground. Finally, secure each lead with the relevant clamp.

4. Fit the bottom cover panel by sliding it rearwards over the bottom chassis member, pushing the back downwards, and locking it in position with the screws provided. (See Fig.4.4.) The bottom cover panel has a large cut-out for the cable bushings at the rear. Fig.4.4 shows the correct orientation.

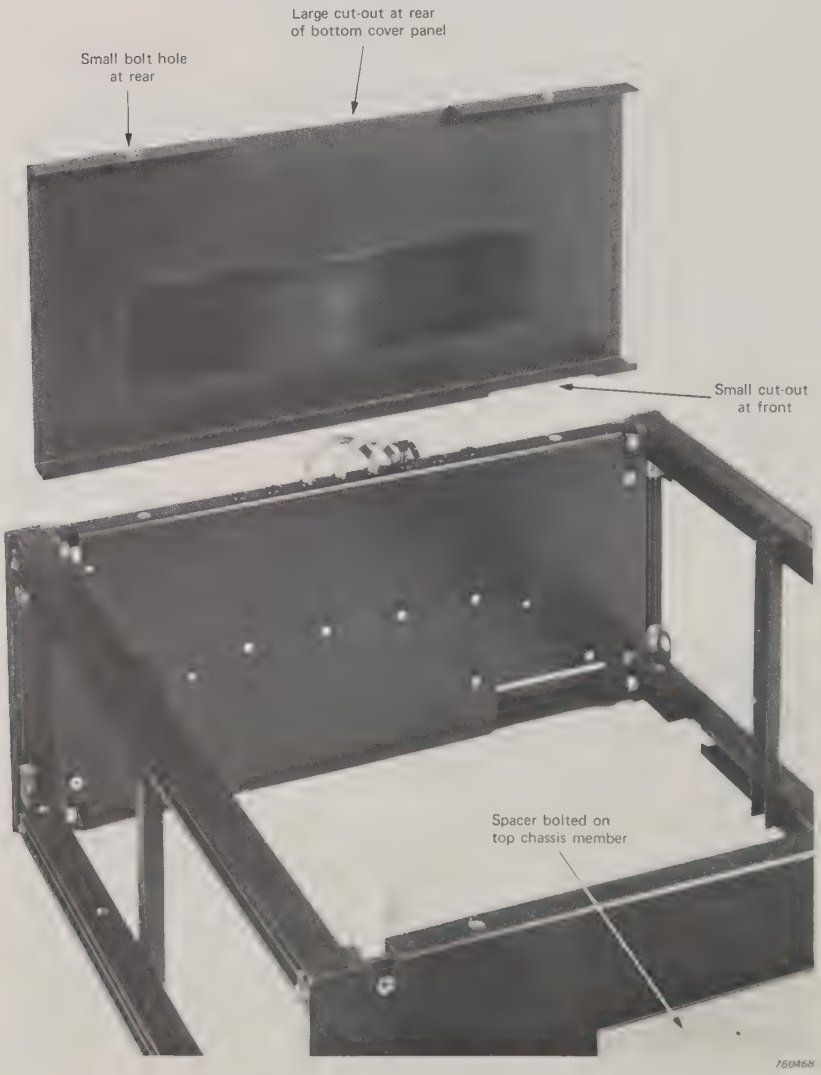


Fig.4.4. Fitting bottom cover panel to rack chassis

5. If a 2307 Level Recorder is to be used (or if no Level Recorder is to be used), the assembly may now be stood on its plastic feet. If a 2305 Level Recorder is to be used, however, remove the plastic feet from the rack assembly, insert the top part of the foot (from kit UA 0507), and then replace the feet. (See Fig.4.5). (This is necessary

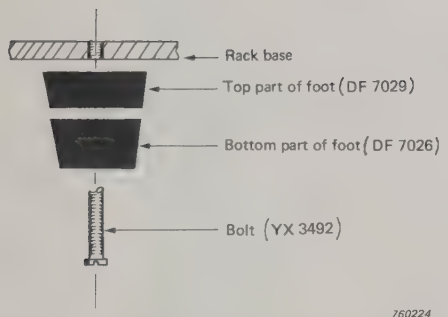


Fig.4.5. Modification of rack feet for different Level Recorders

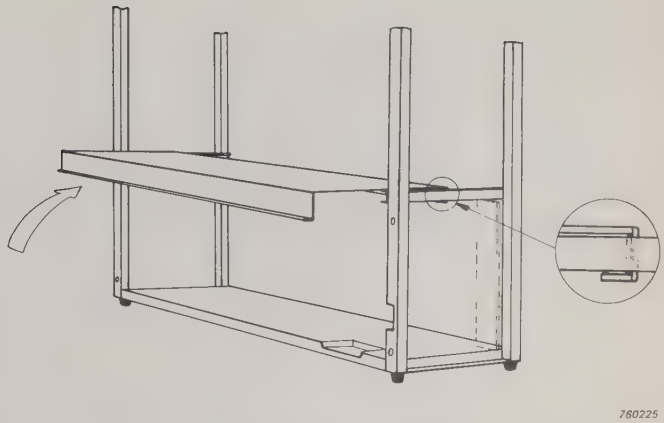


Fig.4.6. Fitting lower shelf without instrument onto rack

because the 2305 has larger feet then the 2307.) Now stand the assembly on its plastic feet.

6. If the instrument to be fitted on the lower shelf is 380 mm (15 in) wide, go to step 7. If the instrument to be fitted on the lower shelf is 430 mm (16,9 in) wide or a mounting frame KK 0014, go to step 14.

7. Insert the lower shelf (the dark-green one with the outward-facing flange at the front) into the front of the rack, ensuring its correct location on its bearers, and push it fully home. (See Fig.4.6). The correct vertical position of the bearers can be checked using the length of the spacer, shown dotted in Fig.4.6. If movement of these bearers is necessary, consult step 18.

8. Slide the retaining clamps outwards to the shelf bearers, and tighten the 2 screws, to lock the shelf in position. (See Fig.4.7.)

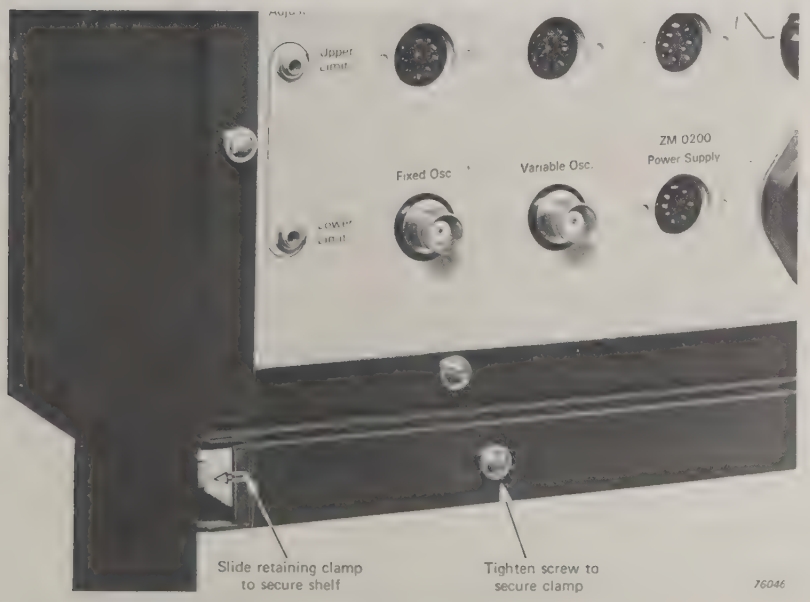


Fig.4.7. Locking shelf into position

9. Mount the two blank panels (selected as in Chapter 1) by inserting their locking tabs into the grooves in the side chassis members and tightening their allen bolts with the allen key supplied. Ensure that the locking tabs are correctly located in the grooves before tightening the bolts. (See Fig.4.8.)

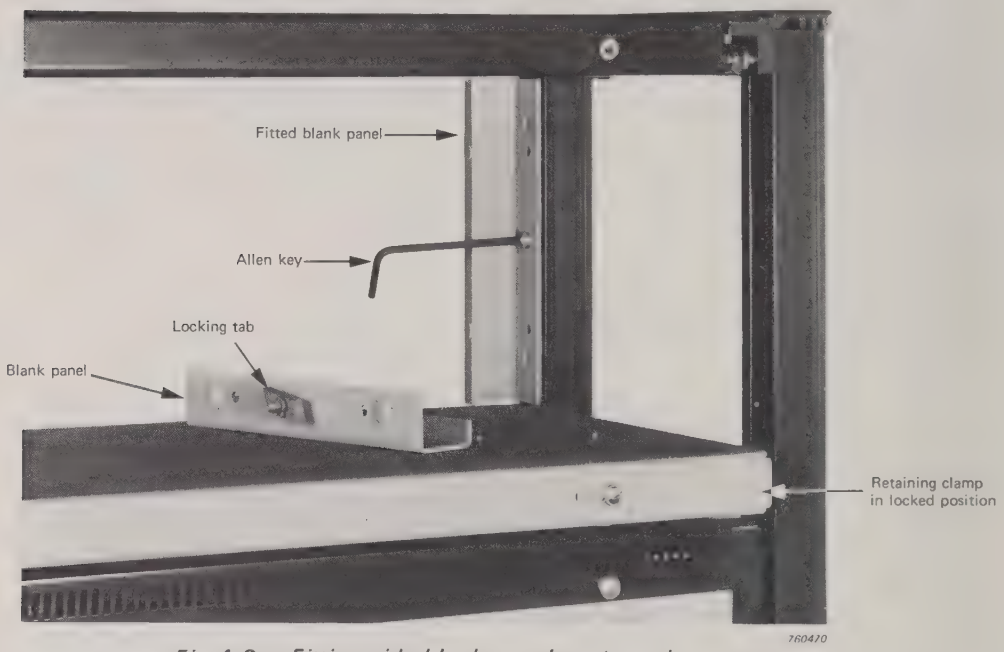


Fig.4.8. Fitting side blank panels onto rack

10. Mount the retaining brackets (2 or 4 as required for the instrument type) a little higher than their required positions by inserting their locking tabs into the grooves in the side chassis members and tightening their allen bolts slightly with the fingers.

11. Remove the 4 feet and the 2 or 4 plastic location pegs from the instrument, and slide it into position on the shelf.

12. Note the position of the threaded bolt heads on the rear of the instrument (2 for smaller instruments and 4 for larger ones), and then slide the retaining brackets downwards into position. Slide the instrument forward a little on the shelf, and tighten the allen bolts holding the brackets with the allen key supplied.

13. Slide the instrument back into position, and bolt it onto the brackets using the bolts supplied. (See Fig.4.9.) Go to step 18.

14. Invert the instrument and remove its 4 feet. (This also applies to the mounting frame KK 0014.)

15. Invert the lower shelf (the dark-green one with the outward-facing flange at the front), and insert the foot-retaining bolts through the holes in the shelf, thus clamping the instrument to the shelf. If the bolts are long enough, the feet can be clamped to the shelf as well, but if not the feet should be discarded. (See Fig.4.10.) If a mounting frame KK 0014 is used, then 4 longer bolts (YV 3327) should be ordered and used together with the feet.

16. With the shelf/instrument assembly the correct way up, remove the 2 or 4 plastic location pegs from the top of the instrument.

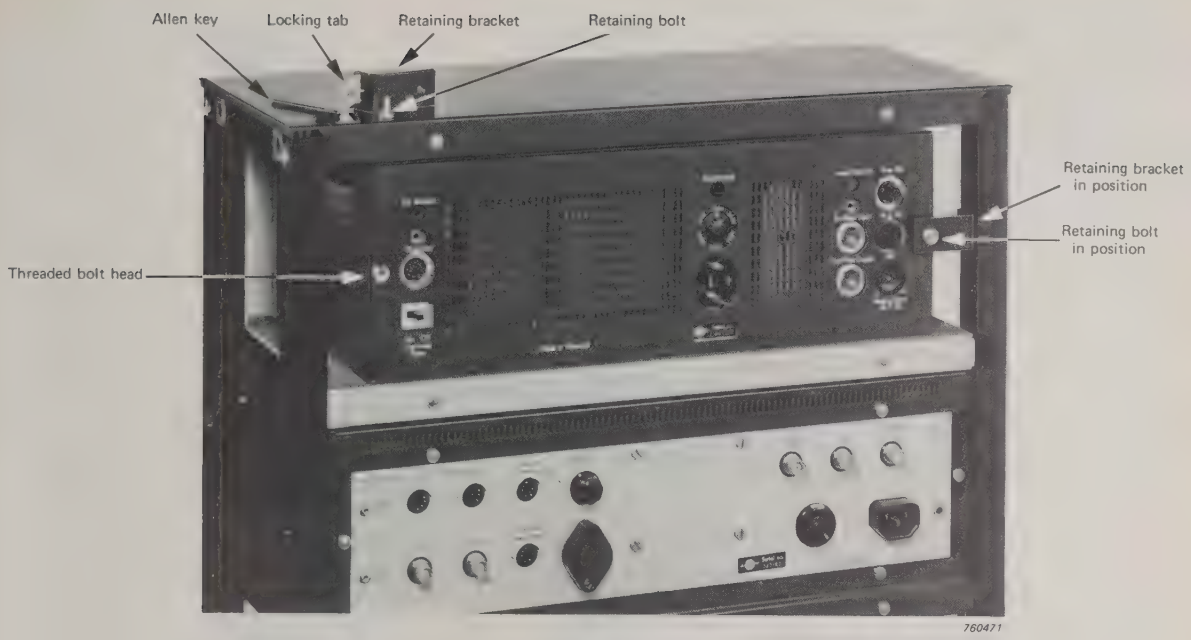


Fig.4.9. Fixing instrument to rack with retaining brackets

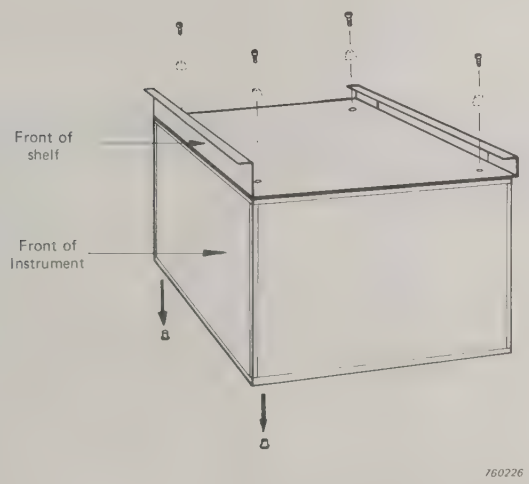


Fig.4.10. Bolting instrument to lower shelf

17. Carefully slide the shelf/instrument assembly into the front of the rack, ensuring the correct location of the shelf onto its bearers, and push it fully home. (See Fig.4.11.) Lock it into position as described in step 8.

18. If more instruments have to be fitted, then separation shelf kits (KS 0037) are needed. The shelf bearers included in KS 0037 should be fitted as shown in Fig.4.12. Insert the locking tabs into the grooves in the side chassis members, ensuring the bearers are mounted the correct way round, with their chamfered corners towards the rear; the correct vertical location should be ensured using the spacer provided, and the correct horizontal position by adjusting the front edges of the bearers to be flush with the front surface of of the side chassis members. Tighten the

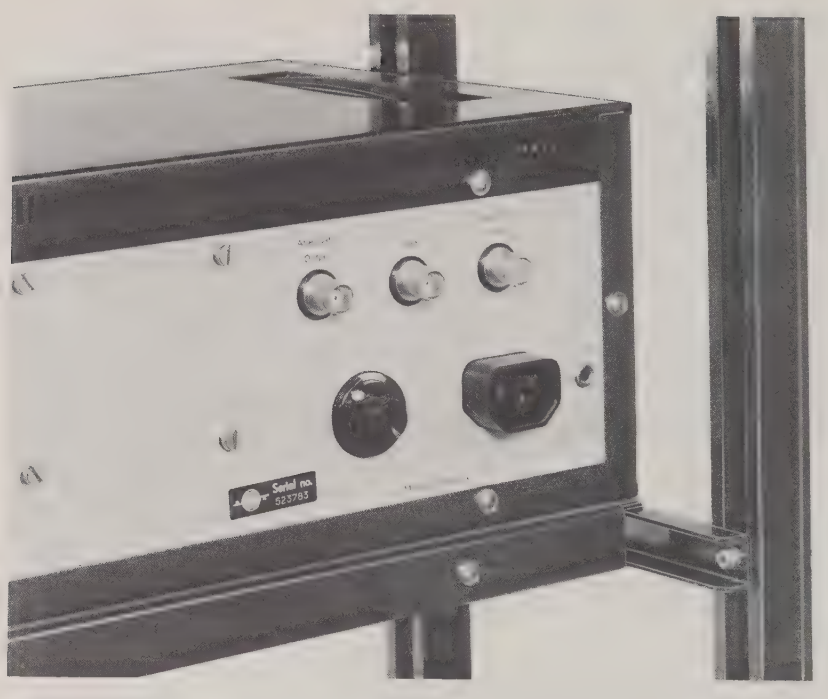


Fig.4.11. Fitting lower shelf with instrument onto rack

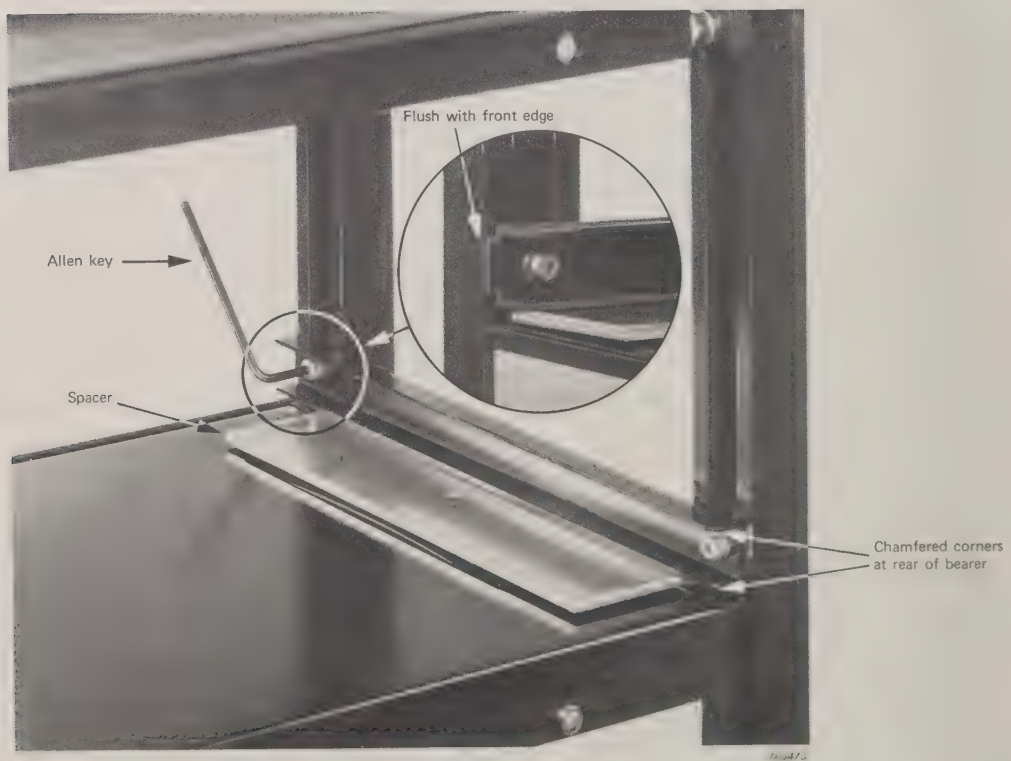


Fig.4.12. Fitting shelf bearers onto rack

allen bolts with the allen key provided. If the lower bearers need adjusting, see also Fig.4.6.

19. These light-green separation shelves and further instruments are fitted as described in paragraphs 7 to 17. If there is a space above the instruments, then a blank panel should be fitted by inserting it in the required position and pushing its 4 retaining clamps outwards into the grooves in the side chassis members. (See Fig.4.13.) The correct blank panel is selected as described in Chapter 1.

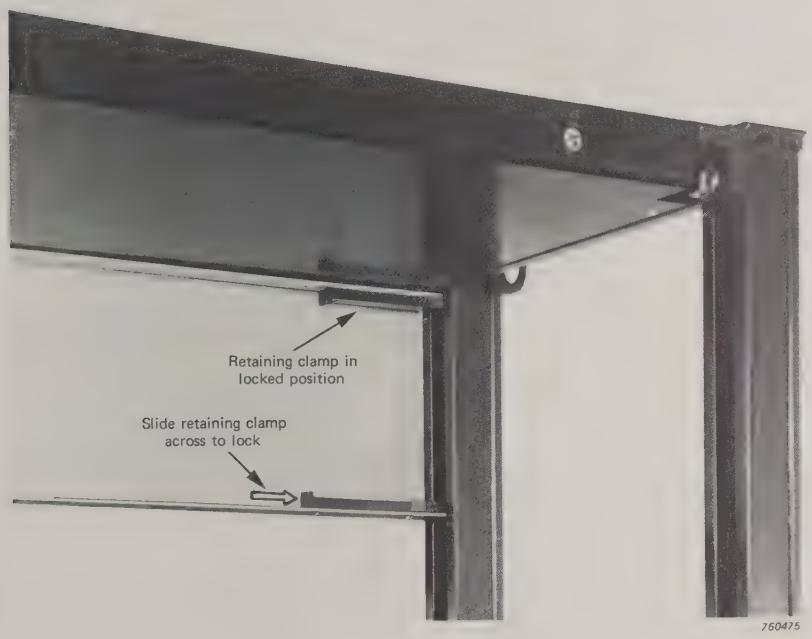


Fig.4.13. Fitting horizontal blank panel onto rack

20. The spacer should be mounted on top of the top chassis member using the M 4 × 6 bolt provided. The top cover panel is then fitted by sliding it rearwards over the top chassis member, pushing the back downwards, and locking it in position with the two screws provided. (This is similar to the fitting of the bottom cover panel, paragraph 4, Fig.4.4).

4.3. MOUNTING THE LEVEL RECORDER TYPE 2305

The procedure for mounting the Type 2305 Level Recorder is as follows:

1. Detach the rear panel of the Level Recorder (FB 2305) by removing the 3 retaining screws YV 2364 and 2 screws YV 3364. (See Fig.4.14).

2. Using the 4 bolts and 8 spacing washers from mounting kit UA 0507, bolt on the spacer plates from mounting kit UA 0484 (included in KQ 0118 to KQ 0121) to the rear of the 2305. One spacing washer should be used at the top, and 3 at the bottom. (See Fig.4.15.) (The feet on the rack system should have been extended, see section 4.2, step 5.)

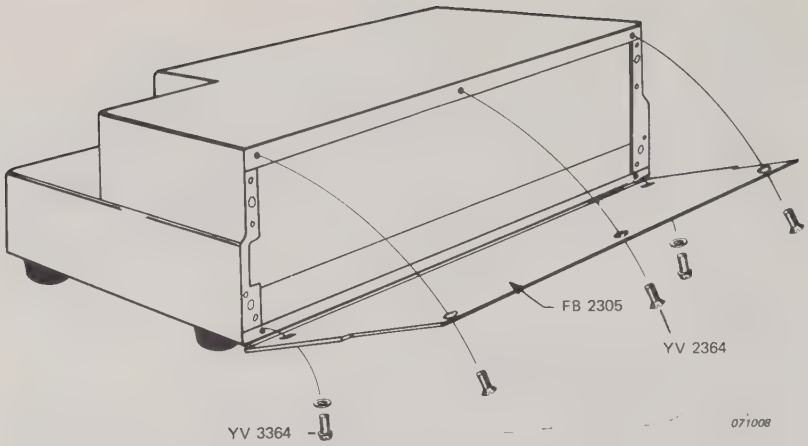


Fig.4.14. Removing the rear panel of 2305

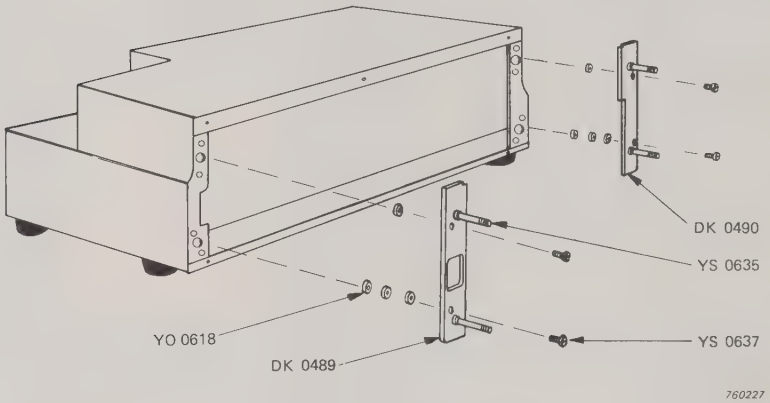


Fig.4.15. Mounting spacer plates on rear of 2305

3. Carefully slide the Level Recorder and the rack assembly together, guiding the studs on the spacer plates through the holes in the side chassis numbers of the rack; do not damage the threads on the studs.

4. Using the washers and finger nuts supplied in kit UA 0484, clamp the Level Recorder to the rack assembly.

4.4. MOUNTING THE LEVEL RECORDER TYPE 2307

The procedure for mounting the Type 2307 Level Recorder is as follows:

1. Detach the rear panel of the Level Recorder (FB 2307), by removing the 3 retaining screws YV 2364 and lifting the panel up out of its anchoring slot. (See Fig.4.16.)

2. Using the 4 allen bolts from mounting kit UA 0484, bolt on the spacer plates (from the same kit) to the rear of the 2307. No spacing washers are necessary. (See Fig.4.17.)

3. Continue as in step 3 and 4 of section 4.3.

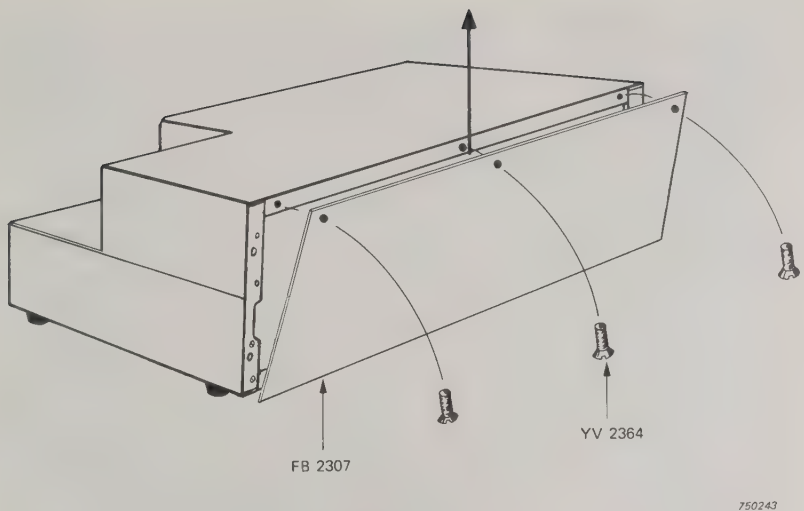


Fig.4.16. Removing the rear panel of 2307

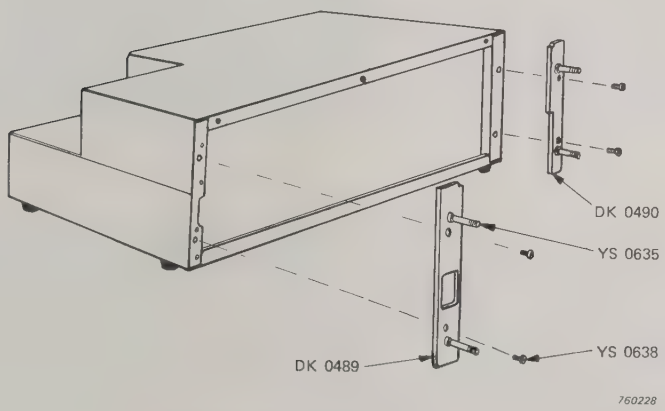


Fig.4.17. Mounting spacer plates on rear of 2307

4.5. MOUNTING CHAIN-DRIVE SPROCKETS ON THE LEVEL RECORDER

If a Generator or Analyzer is to be used in conjunction with the Level Recorder, it is necessary to use a chain-drive connection between them, as the flexible drive shaft UB 0041 cannot be used when the instruments are mounted in the rack with the side cover panels fitted.

4.5.1. Use of DRIVE SHAFT I

If it is a requirement that the scanning of the Generator or Analyzer should be synchronized with the pre-printed recording paper QP 1124, QP 1130, QP 1143, QP 1152, etc., then DRIVE SHAFT I of the Level Recorder should be used for the chain drive. The drive-shaft cover plate should be removed from the side panel of the Level Recorder. In the case of the 2305, both retaining screws must be removed, whereas in the case of the 2307 the two screws only need be loosened. DRIVE SHAFT I is fitted with a drive sprocket in each Level Recorder. Figs.4.18 and 4.19 show the position of the chain and sprocket when fitted for use in the rack system for the 2305 and 2307 respectively.

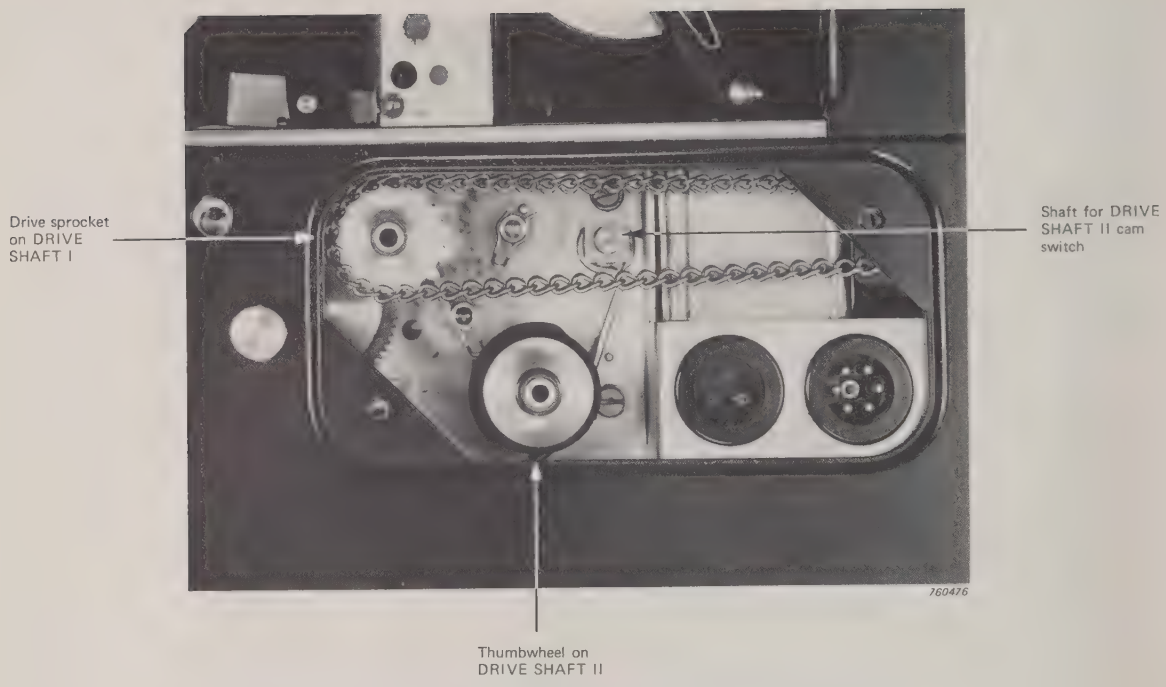


Fig.4.18. Chain path using DRIVE SHAFT I of 2305

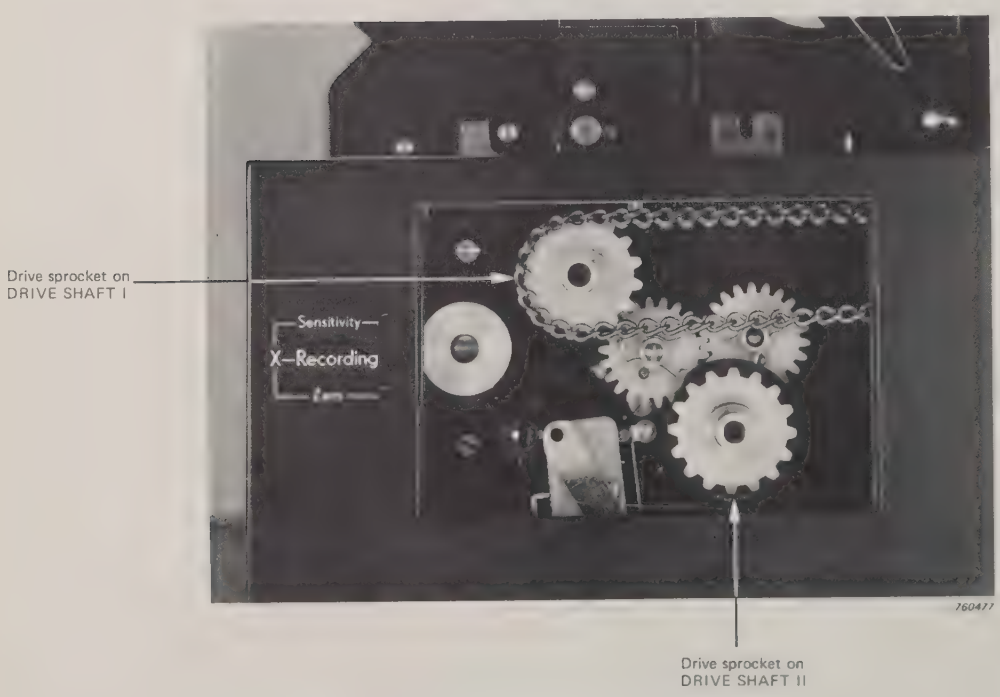


Fig.4.19. Chain path using DRIVE SHAFT I of 2307

4.5.2. Use of DRIVE SHAFT II

If the facility for varying the relationship between chart movement and frequency sweep is required (i. e. compressing or expanding the frequency scale), then DRIVE SHAFT II

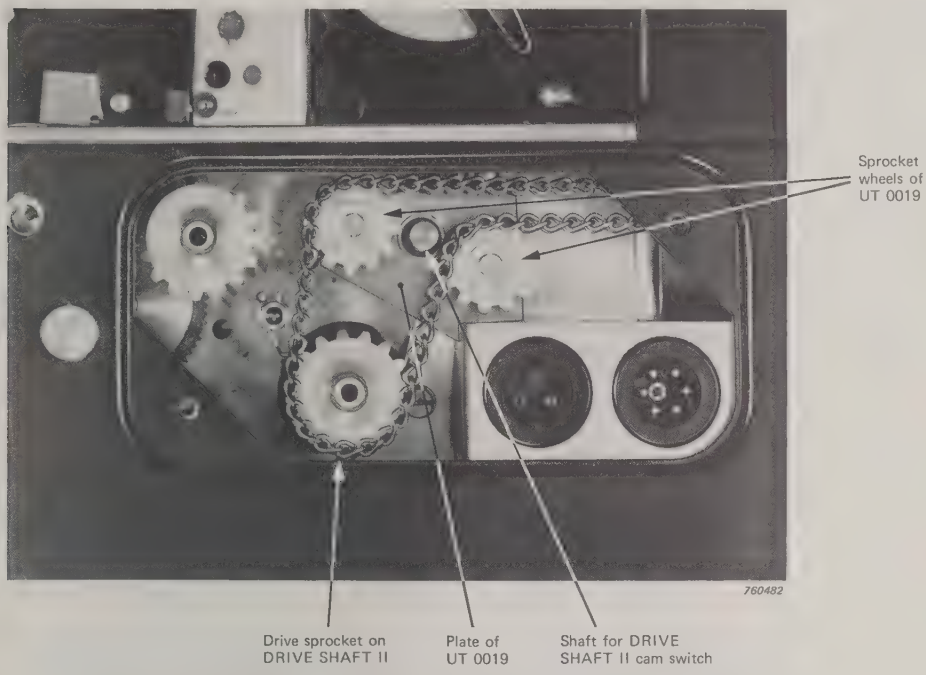


Fig.4.20. Chain path using DRIVE SHAFT II of 2305

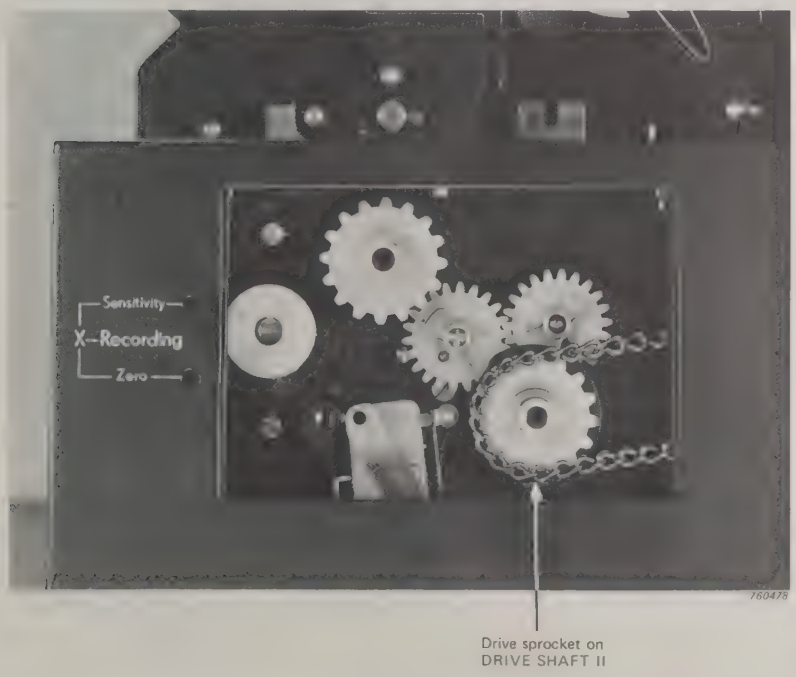


Fig.4.21. Chain path using DRIVE SHAFT II of 2307

should be used for the chain drive. The drive-shaft cover plate should be removed from the side panel of the Level Recorder (see section 4.5.1). DRIVE SHAFT II is not fitted with a sprocket in the 2305, and the additional accessory kit UT 0018 is required, which is supplied as part of the kit UT 0026. (UT 0018 consists of a plate with two sprocket wheels fitted (UT 0019), and the drive sprocket DG 0070.) Remove the thumb-wheel (YM 0046) which retains the cam discs, and screw the sprocket DG 0070 in its place. (See Figs.4.18 and 4.20.) Slide UT 0019 over the shaft for the DRIVE SHAFT II CAM SWITCH. No additional locking device is required. In the 2307 a sprocket is already fitted, and no further accessories are necessary. Figs.4.20 and 4.21 show the position of the chain and sprocket when fitted for use in the rack system for the 2305 and 2307 respectively.

4.6. MOUNTING THE CHAIN TIGHTENER UT 0025

The chain tightener UT 0025 is supplied as part of the kits UT 0026 and UT 0027. Insert the locking tabs into the groove of the right side chassis member (at the base where the cut-out is for the chain), and tighten the allen bolts using the allen key provided. (See Fig.4.22.) Since the chain-drive sprockets of the 2305 and 2307 are in a different plane, it is necessary to put the guide wheels on the chain tightener into the correct posi-

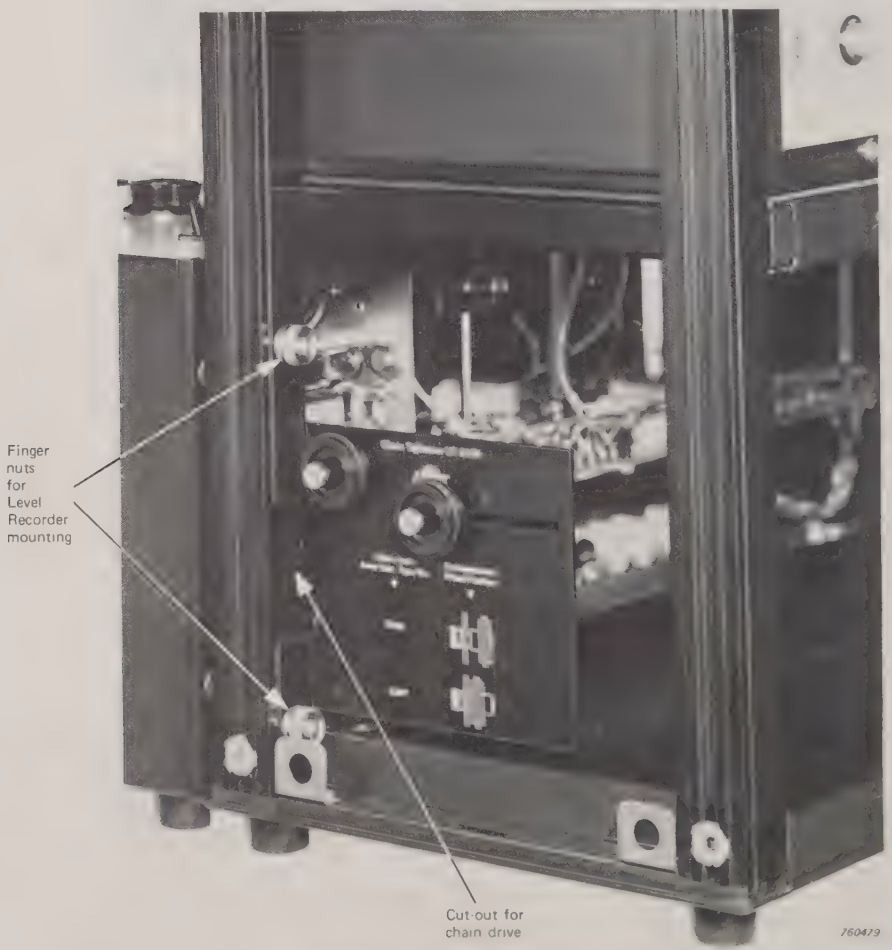


Fig.4.22. Installation of chain tightener UT 0025 on rack

tion for the Level Recorder used. The two positions possible are shown clearly on the chain tightener itself. To effect this, the finger nut and washer should be removed from the shaft; the shaft, spacer and guide wheel are then removed; the guide wheel is then reversed, and the whole assembly replaced. This must be done for both guide wheels. The front guide wheel should be slid to its uppermost position, and the other to its forward-most position.

4.7. MOUNTING THE CHAIN-SPROCKET ASSEMBLY ON THE INSTRUMENT

Each instrument which is to be chain driven must be fitted with a chain-sprocket assembly (UT 0014 or UT 0024 as appropriate, depending on the width of the instrument, see last Table of Chapter 1). This should be screwed into the threaded hole which is normally used for flexible drive shaft UB 0041 on the right side of the instrument. As with the guide wheels on the chain tightener, the position of the sprocket on its shaft depends on which Level Recorder is used. The position is changed by loosening the grub screw holding the sprocket on its shaft, reversing the sprocket, and retightening the grub screw. This is shown for the UT 0014 in Fig.4.23. The procedure is identical for the shorter assembly UT 0024.

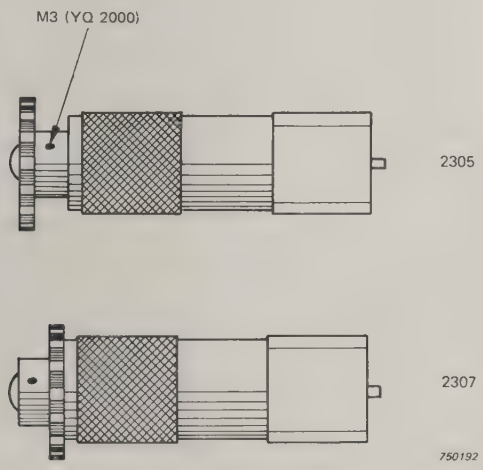


Fig.4.23. Sprocket position on chain-sprocket assembly

4.8. THREADING THE DRIVE CHAIN

The drive chain DX 0030 is supplied with kits UT 0026 and UT 0027 in a single length of 2,60 m. The threading procedure is as follows:

1. Using the chain hook QA 0028 provided, thread the chain through from the rack assembly, inside the side panel of the Level Recorder, and out through the gap by the Level Recorder sprockets. (See Fig.4.24.)

2. To facilitate threading the chain onto the sprockets, the Level Recorder PAPER SPEED knob (if DRIVE SHAFT I is to be used) or the DRIVE SHAFT (II) SPEED knob (if DRIVE SHAFT II is to be used) should be set to an intermediate position. (See Fig.4.25.) This allows the drive sprockets to be turned freely by hand. The path of the chain around the Level Recorder drive sprockets can be seen from Figs.4 18 to 4.21.

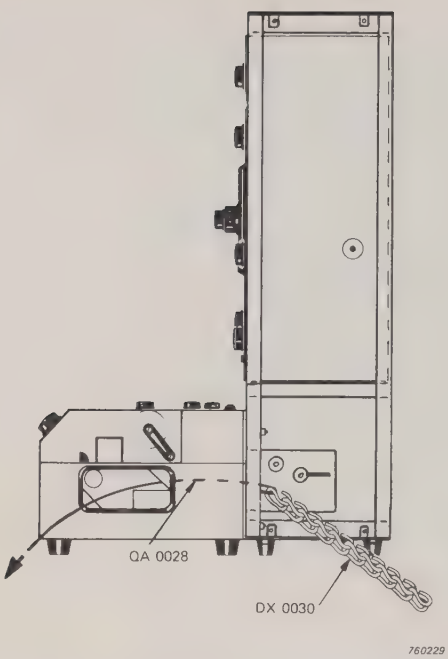


Fig.4.24. Threading chain using chain hook

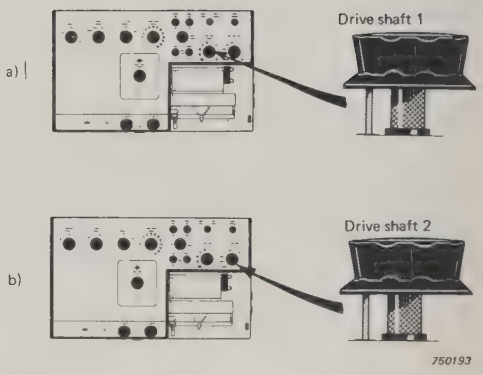


Fig.4.25. Setting the controls to an intermediate position

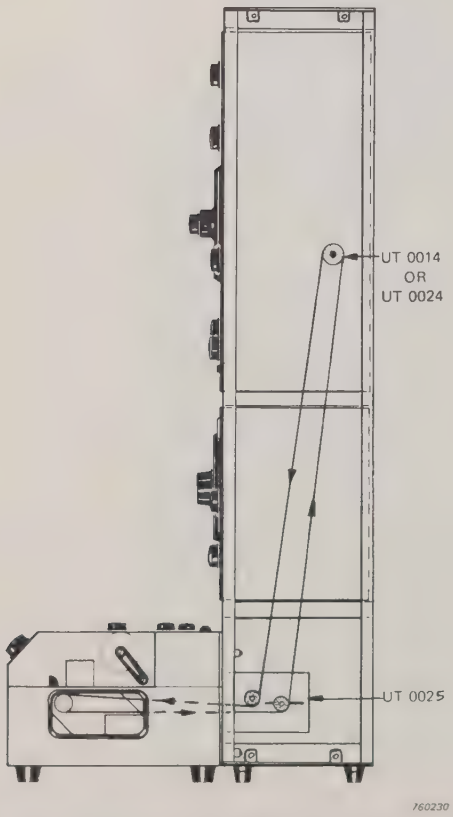


Fig.4.26. Typical instrument set-up showing chain path

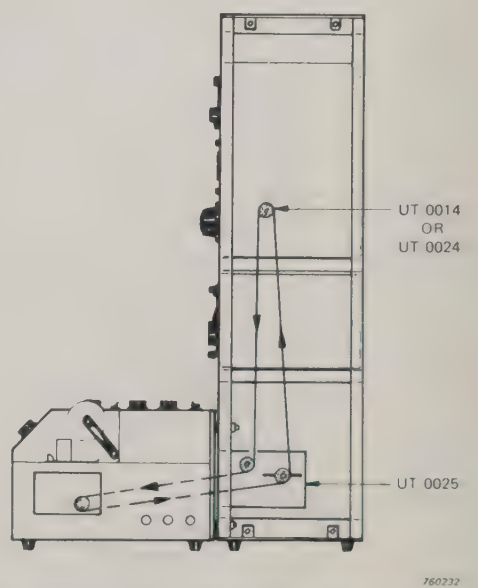


Fig.4.27. Typical instrument set-up showing chain path

3. The chain should now be threaded back inside the Level Recorder side panel to the rack assembly using the chain hook.

4. Wind the chain around the guide wheels on the chain tightener, and then around the sprockets on the instruments. (See Figs.4.26 and 4.27 for some typical examples of chain paths.)

5. Remove the unwanted length of chain by opening the appropriate link with a screwdriver, then reconnect the chain into a loop and reform the link to its original shape. (See Fig.4.28.)

6. Ensure that the chain is not twisted, and take up the slack using the chain tightener. (See Fig.4.29.)

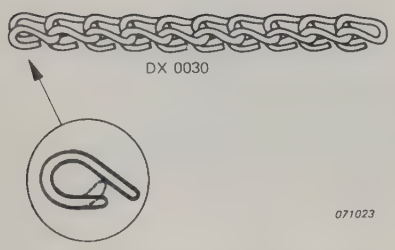


Fig.4.28. Reforming the chain link

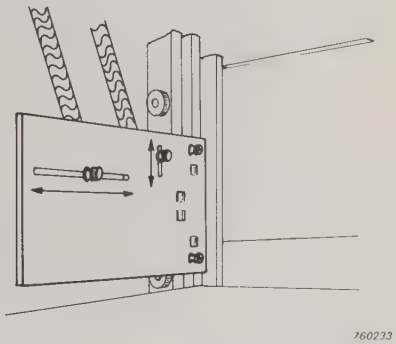


Fig.4.29. Tightening the chain

7. Check that the chain drive can run freely by moving it by hand.

8. Reset the Level Recorder PAPER SPEED knob or DRIVE SHAFT (II) SPEED knob, and check that the chain is turned correctly by the Level Recorder's motor.

4.9. FINAL POINTS

After checking that the instruments are correctly mounted, and the chain drive is working properly, the following points should be completed:

1. Replace the drive-shaft cover plate on the Level Recorder side panel.

2. Replace both the cover panels on the side chassis members of the rack, and turn the 8 snap-locking screws clockwise until they "click" (about half a turn). See section 4.2, paragraph 1 and Fig.4.1.

3. Make all the connections required on the rear panels of the instruments for signals and remote controls.

4. Make all the necessary adjustments on the rear panels of the instruments, including the mains voltage selection.

5. Plug in the mains cables from the distribution block to the various instruments, and connect the whole system to the mains power supply.

6. Move the whole rack/instrument assembly to its required position.

Fig.4.30. Typical completed instrument set-up (front view)

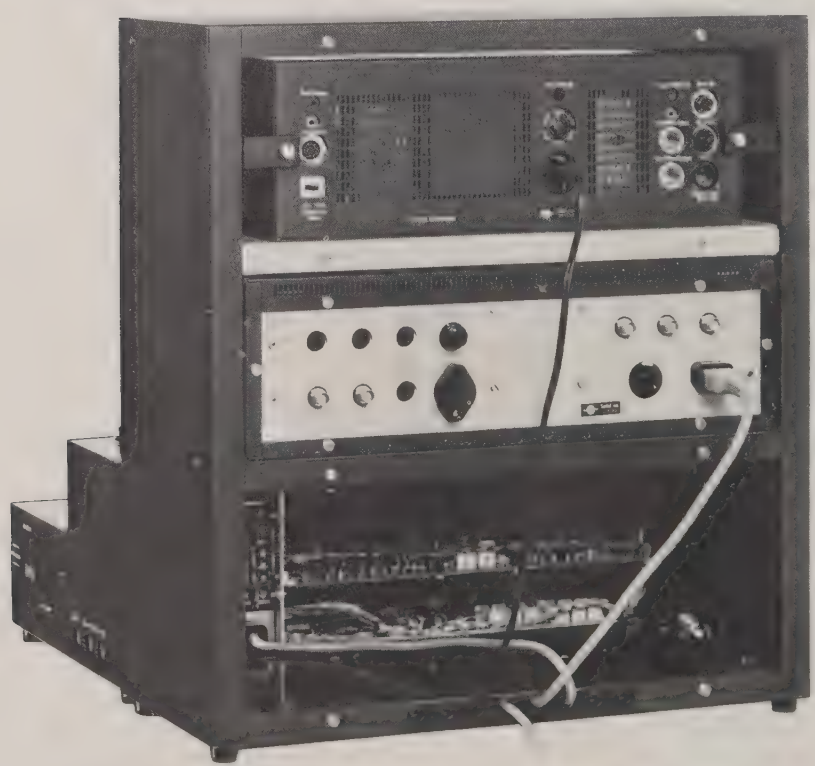


Fig.4.31. Typical completed instrument set-up (rear view)

Plastic dust covers are supplied for each rack/Level Recorder combination, for protection when the system is not in use.

Fig.4.30 shows a typical example of an instrumentation set-up. (Figs.6 and 7 of Chapter 1 also show examples of instrumentation mounted in racks.) Fig.4.31 shows the same set-up as that of Fig.4.30 but seen from the rear. The mains power supply connections are also shown.

4.10 PARTS LISTS

Table 4.1 shows the components which are supplied with the 4 basic rack systems KQ 0118, KQ 0119, KQ 0120 and KQ 0121.

Component	Quantity	Part No.			
		KQ 0118	KQ 0119	KQ 0120	KQ 0121
Chassis member, top	1	EA 0312	EA 0312	EA 0312	EA 0312
Chassis member, left side	1	FC 5008	FC 5010	FC 5012	FC 5014
Chassis member, right side	1	FC 5009	FC 5011	FC 5013	FC 5015
Chassis member, bottom + distribution block	1	ZG 0131	ZG 0131	ZG 0131	ZG 0131
Cover panel, top	1	FD 0025	FD 0025	FD 0025	FD 0025
Cover panel, bottom	1	FD 0026	FD 0026	FD 0026	FD 0026
Cover panel, left	1	GV 1414	GV 1415	GV 1416	GV 1417
Cover panel, right	1	GV 1418	GV 1419	GV 1420	GV 1421
Lower shelf	1	GV 1431	GV 1431	GV 1431	GV 1431
Spacer (shelf adjustment)	1	GU 1090	GU 1090	GU 1090	GU 1090
Dust cover	1	KF 0066	KF 0076	KH 0053	KF 0023
Allen screw (M4 x 10)	16	YQ 9507	YQ 9507	YQ 9507	YQ 9507
Screw (cover plate fixing)	4	YV 1325	YV 1325	YV 1325	YV 1325
Allen key, 2,5 mm	1	QA 0049	QA 0049	QA 0049	QA 0049
Allen key, 3 mm	1	QA 0038	QA 0038	QA 0038	QA 0038
Level Recorder mounting kit*	1	UA 0484	UA 0484	UA 0484	UA 0484

760010/1

* See Table 4.3

Table 4.1. Components of basic rack systems KQ 0118, KQ 0119, KQ 0120 and KQ 0121

Table 4.2 shows the items which are supplied as the separation shelf kit KS 0037 and Table 4.3 shows the components of the Level Recorder mounting kit UA 0484, which is supplied with the basic rack systems.

Component	Quantity	Part No.
Shelf bearer	2	UA 0483
Separation shelf	1	UA 0493
Allen key, 3 mm	1	QA 0038

760011

Table 4.2. Components of separation shelf kit KS 0037

Component	Quantity	Part No.
Spacer plate, right	1	DK 0489
Spacer plate, left	1	DK 0490
Allen Bolt	4	YS 0638
Stud	4	YS 0635
Finger Nut	4	YM 0622
Washer	4	YO 0639
Allen key, 5 mm	1	QA 0075

760012

Table 4.3. Components of Level Recorder mounting kit UA 0484

Table 4.4 shows the items supplied with each instrument mounting set (UA 0489, UA 0490, UA 0491 or UA 0492) for narrower 380 mm instruments. The selection of which set to use is given in the last Table of Chapter 1.

Component	Quantity				Part No.			
	UA 0489	UA 0490	UA 0491	UA 0492	UA 0489	UA 0490	UA 0491	UA 0492
Retaining bracket	2	4	4	4	UA 0482	UA 0482	UA 0482	UA 0482
Bolt	2	4	4	4	YS 0472	YS 0472	YS 0472	YS 0472
Blank panel (side)	2	2	2	2	UA 0485	UA 0486	UA 0487	UA 0488
Allen key, 3 mm	1	1	1	1	QA 0038	QA 0038	QA 0038	QA 0038

760013

Table 4.4. Components of instrument mounting sets UA 0489, UA 0490, UA 0491 and UA 0492 for 380 mm-width instruments

Table 4.5 shows the additional items necessary for attaching the 2305 Level Recorder to the rack system (mounting set UA 0507).

Component	Quantity	Part No.
Top part of foot	4	DF 7029
Bolt (spacer plate attachment)	4	YS 0637
Spacing Washer	8	YO 0618

760014

Table 4.5. Components of 2305 mounting kit UA 0507

Table 4.6 shows the components supplied in the chain-drive assembly kits for the Level Recorders (UT 0026 for the 2305 and UT 0027 for the 2307).

Component	Quantity		Part No.
	UT0026	UT0027	
Chain, 2,60 m	1	1	DX 0030
Chain hook	1	1	QA 0028
Sprocket accessory kit	1		UT 0018
Chain tightener	1	1	UT 0025
Allen key, 3 mm	1	1	QA 0038

760015

Table 4.6. Components of chain-drive assembly kits UT 0026 and UT 0027

5. KS ADAPTORS TO 19-INCH RACK

5.1. GENERAL

Adaptors are available to enable virtually all B & K instruments to be fitted into a 19-inch rack system. In the newer instruments, the chassis is built on an extruded-aluminium front panel, to which flanges can be fitted to adapt to the 19-inch rack. These KS flange mountings are shown in Table 5.1. For those instruments where flange mountings are not practical, kits for making rack-mounting frames are available, also under KS accessory numbers. These are also shown in Table 5.1.

Flange/Frame Set Number (See Tables 5.2. & 5.3)	Instrument Dimensions			Instrument Types
	Height mm (in)	Width mm (in)	Depth mm (in)	
KS 0001 (Frame)	480 (18,9)	380 (15)	200 (7,9)	2010 (1013, 1017, 1022, 1024, 2107)
KS 0009 (Frame)	480 (18,9)	380 (15)	355 (14)	4712
KS 0013 (Frame)	280 (11)	380 (15)	140 (5,5)	(2007)
KS 0014 (Flange)	132,6 (5,2)	380 (15)	*	1902, 2607, 4143, 4911 (2606, 2608)
KS 0015 (Frame)	280 (11)	380 (15)	200 (7,9)	2020, 2120 (1614, 1615, 2121)
KS 0016 (Frame)	380 (15)	380 (15)	200 (7,9)	(1402, 2113, 2114, 2603)
KS 0018 (Frame)	380 (15)	380 (15)	350 (13,8)	(2130, 4710)
KS 0019 (Flange)	177 (7)	430 (16,9)	*	2707 (2021)
KS 0020 (Flange)	310,4 (12,3)	430 (16,9)	*	2708 (1026)
KS 0022 (Flange)	132,6 (5,2)	430 (16,9)	*	KK 0014, Flange Kit supplied
KS 0023 (Flange)	132,6 (5,2)	430 (16,9)	*	1526, 1544, 1545, 1901, 2712, 4429, 5612, 7400 (6701)
KS 0024 (Flange)	177 (7)	430 (16,9)	*	1047, 7502, 7507
KS 0027 (Flange)	310,4 (12,3)	430 (16,9)	*	2031, 2033, 2131
KS 0029 (Flange)	132,6 (5,2)	380 (15)	200 (7,9)	KK 0010, Flange Kit supplied
KS 0030 (Flange)	221,5 (8,7)	430 (16,9)	320 (12,6)	(1406, 1632, 1633, 1634, 1635)
KS 0036 (Flange)	132,6 (5,2)	430 (16,9)	410 (16)	(2030)
KS 0038 (Flange)	132,6 (5,2)	430 (16,9)	200 (7,9)	1617, 1618, 2610, 2636, 2713, 2811, 4417, 6302
KS 0039 (Flange)	100 (3,9)	430 (16,9)	266 (10,3)	2308, 2309
UA 0480 (Flange)	132,6 (5,2)	430 (16,9)	200 (7,9)	1023 (Chain Sprocket UT 0024 included)
UA 0481 (Flange)	221,5 (8,7)	430 (16,9)	200 (7,9)	1027 (Chain Sprocket UT 0024 included)

760016-1

* Instruments of different depths can be fitted

** Parentheses in this column indicate earlier Instrument Types

Table 5.1. Flange and frame rack-mounting sets

5.2. MOUNTING FLANGES ON INSTRUMENTS

The method of mounting the flanges on most recent instruments is shown in Fig.5.1. The mounting procedure is as follows (see the circled numbers on Fig.5.1):

1. Invert the instrument, and remove the 2 screws on the rear panel which hold the baseplate in place. Slide the baseplate back a little.

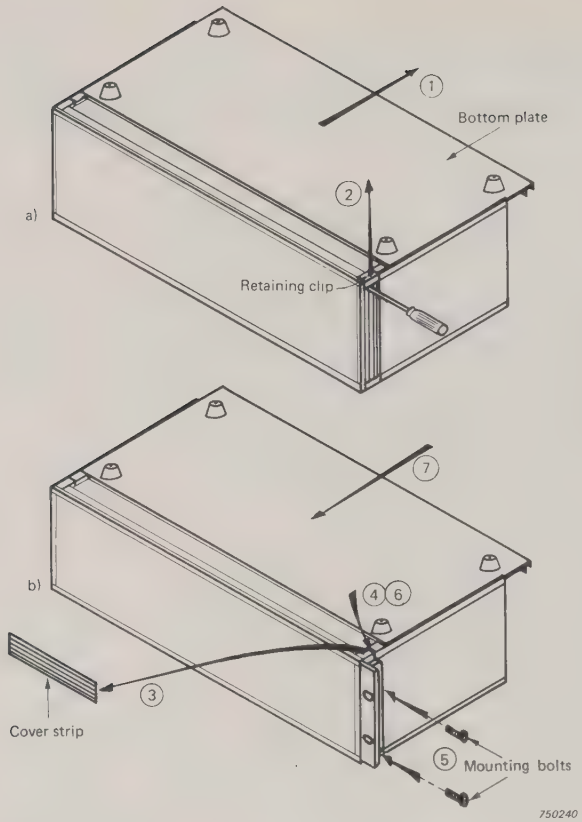


Fig.5.1. Fitting rack-mounting flanges to recent instrument

2. Using a screwdriver, carefully prise out the clips retaining the plastic cover strips on each side of the instrument.

3. Slide the plastic cover strips upwards and out of their grooves.

4. Slide the flanges into place so that the holes are lined up.

5. Fasten the flanges in place with the bolts supplied.

6. Replace the retaining clips.

7. Slide the baseplate back into position, and secure it with its 2 screws.

There are some exceptions to this procedure, such as the Power Amplifier Type 2713, which have 4 plastic plugs in the threaded mounting holes which must first be removed. Then the mounting of flanges (KS 0038 for the 2713) is as for other instruments. A full description of this is given in the 2713 Instruction Manual, for example.

A different procedure will be found necessary on some of the older instruments, as follows:

1. Remove the outer black metal case, by removing the securing bushes.

2. With a pair of pliers, break off the cut-out sections of the black case to give access to the tapped holes in the side of the cast-aluminium front panel.

3. Replace and secure the black metal case.

4. Fit the flanges in position using the bolts and washers supplied.

5.3. ASSEMBLY AND FITTING OF RACK-MOUNTING FRAMES

The principle of assembly and fitting is shown in Fig.5.2. References to the frame parts A, B and C identify the component numbers from the parts list in Table 5.3 (section 5.7). The procedure is as follows:

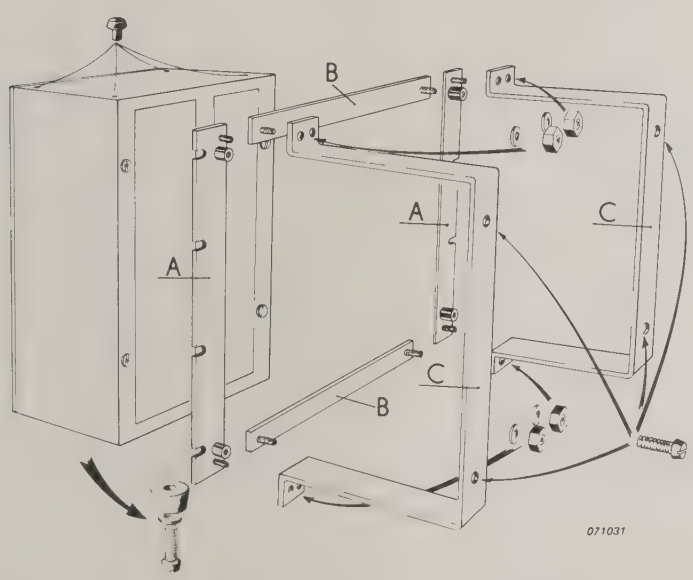


Fig.5.2. Assembly of rack-mounting frame

1. Assemble parts A, B and C into a single frame using the nuts, bolts and washers provided, but do not tighten any nuts at this stage.

2. Remove the 4 rubber feet from the base and the 4 plastic location pegs from the top of the instrument to permit mounting of the frame.

3. Attach the frame to the instrument using the 4 bolts supplied.

4. Tighten all nuts and bolts.

5.4. ATTACHING INSTRUMENTS TO THE 19-INCH RACK

5.4.1. Instruments with rack-mounting flanges or frames

The instruments with rack-mounting flanges or frames, fitted as in sections 5.2 or 5.3 respectively, simply have their flanges bolted to the front of the 19-inch rack in the required position.

5.4.2. Level Recorder Type 2305

In order to mount the Level Recorder onto the 19-inch rack system, the following procedure should be used:

1. Detach the rear panel of the Level Recorder (see section 4.3, step 1).

2. Remove the spacer plates GU 0123 and GU 0124 (already fitted on the 2305) from the rear of the frame. (See Fig.5.3.)

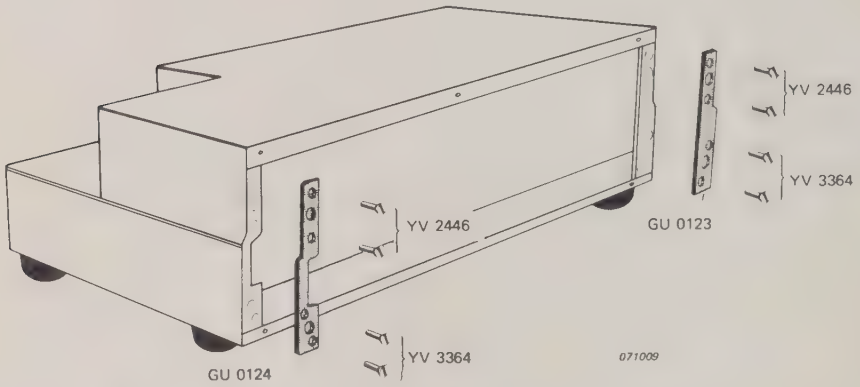


Fig.5.3. Removing spacer plates from rear of 2305

3. Refit the spacer plate GU 0123 to the right-hand side when viewed from the rear together with the additional spacer GU 0164 using the same screws. (See Fig.5.4.)

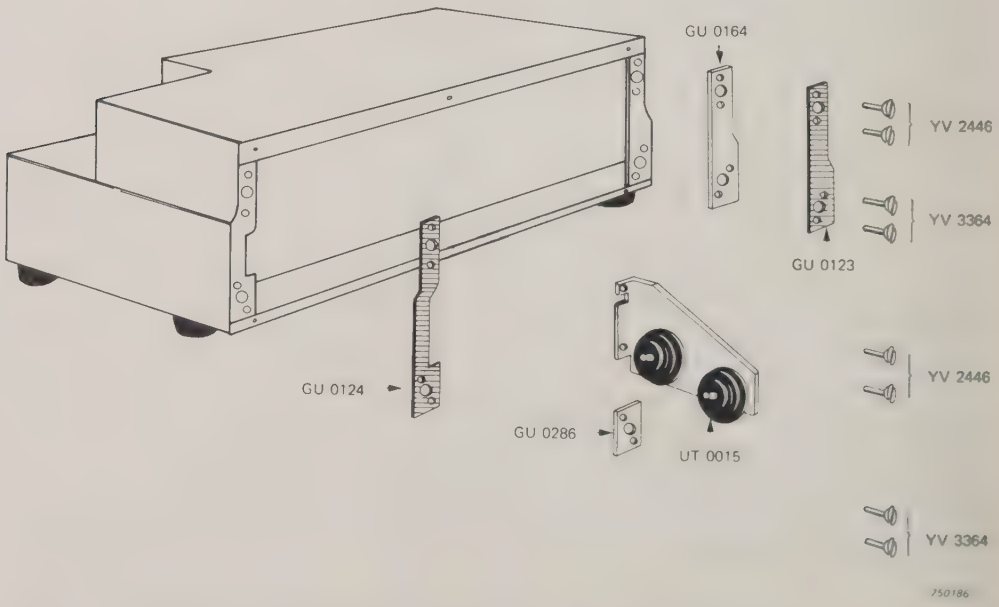


Fig.5.4. Mounting spacer plates and chain tightener on rear of 2305

4. If a chain drive is to be used, go to step 5. If a chain drive is not to be used, go to step 6.

5. Refit the spacer plate GU 0124 to the left-hand side when viewed from the rear together with the spacer plate GU 0286 on the two lower mounting holes and the chain tightener UT 0015 (supplied as part of UA 0439) on the two upper mounting holes using the same screws. (See Fig.5.4.) Go to step 7.

6. Refit the spacer plate GU 0124 to the left-hand side when viewed from the rear together with the additional spacer GU 0164 using the same screws. (See Fig.5.5.)

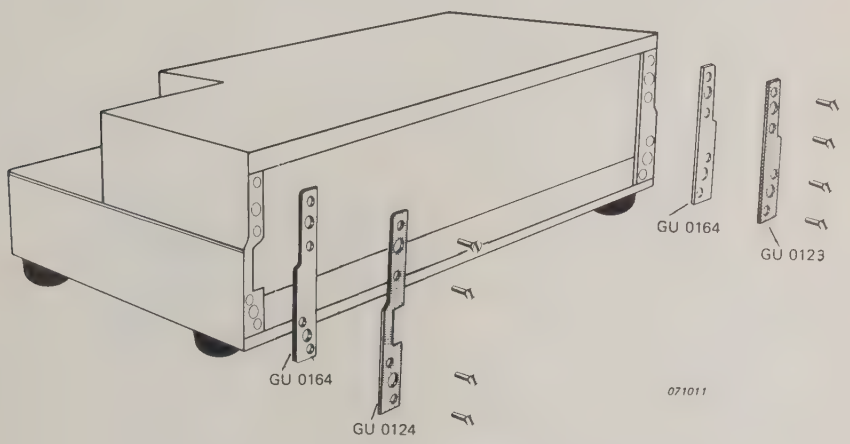


Fig.5.5. Mounting spacer plates on rear of 2305

7. Attach the Level Recorder to the rack using 4 bolts YS 0607 (1/4 in Whitworth thread) and washers YO 0616 through the rack frame and into the rear of the Level Recorder. (If the chain tightener UT 0015 is mounted, a cut-out must be made in the appropriate place in the flange of the 19-inch rack.)

5.4.3. Level Recorder Type 2307

In order to mount the Level Recorder onto the 19-inch rack system, the following procedure should be used:

1. Detach the rear panel of the Level Recorder (see section 4.4, step 1).

2. If a chain drive is to be used, bolt the chain tightener UT 0021 (supplied as part of UA 0440) onto the rear upper left-hand side of the Level Recorder when viewed from the rear (i.e. the same position as the UT 0015 is mounted on the 2305 as shown in Fig.5.4). No other spacer plates, etc. are needed.

3. Attach the Level Recorder to the rack using the 4 bolts YQ 0254 (M 6 thread) and washers YO 0616 through the frame and into the rear of the Level Recorder. (If the chain tightener UT 0021 is mounted, a cut-out must be made in the appropriate place in the flange of the 19-inch rack.)

5.5. USE OF THE CHAIN-DRIVE SYSTEM

The procedure for using the chain-drive system in the 19-inch rack is as follows:

1. Mount the chain-drive sprocket on the Level Recorder as required (see section 4.5).

2. Mount the chain-sprocket assembly on the instrument(s) as required (see section 4.7). In some cases, it may be necessary to do this before the instrument is mounted into the rack.

3. Thread the chain as described in section 4.8, items 1 to 3. See Fig.5.6.

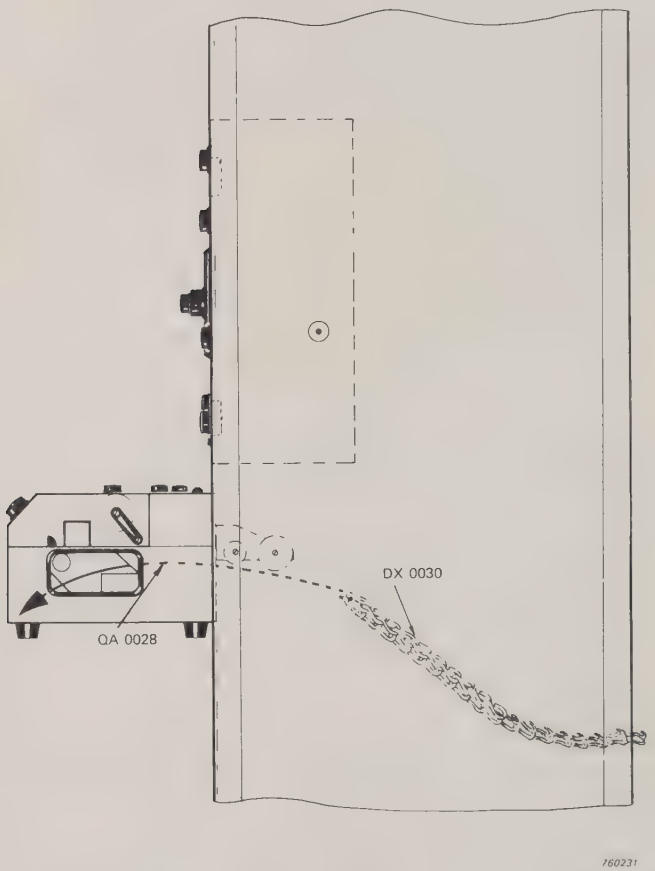


Fig.5.6. Threading chain using chain hook

4. Wind the chain around the guide wheels on the chain tightener, and then around the sprockets on the instrument. (See Figs.5.7 and 5.8 for some typical examples of chain paths.)

5. Remove the unwanted length of chain by opening the appropriate link with a screwdriver, then connect the chain into a loop and reform the link to its original shape. (See Fig.4.28.)

6. Ensure that the chain is not twisted, and take up the slack using the chain tightener. (See Fig.5.9.)

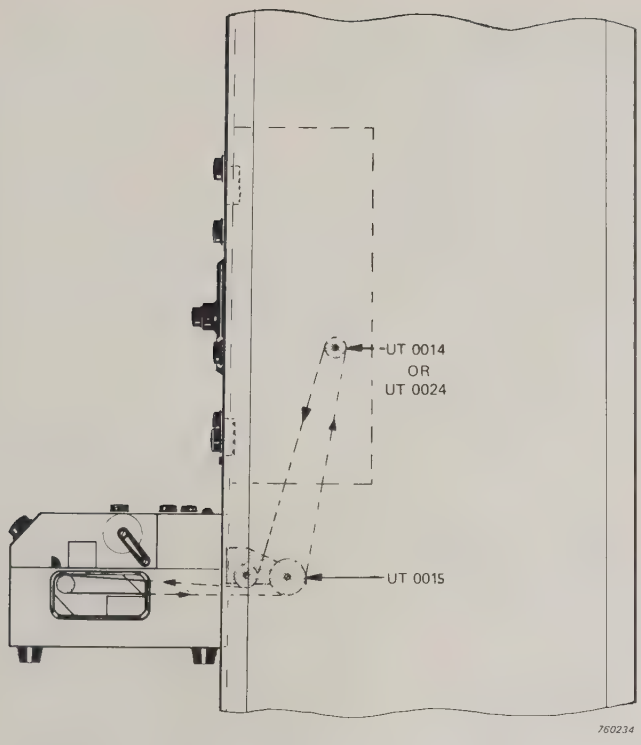


Fig.5.7. Typical instrument set-up showing chain path

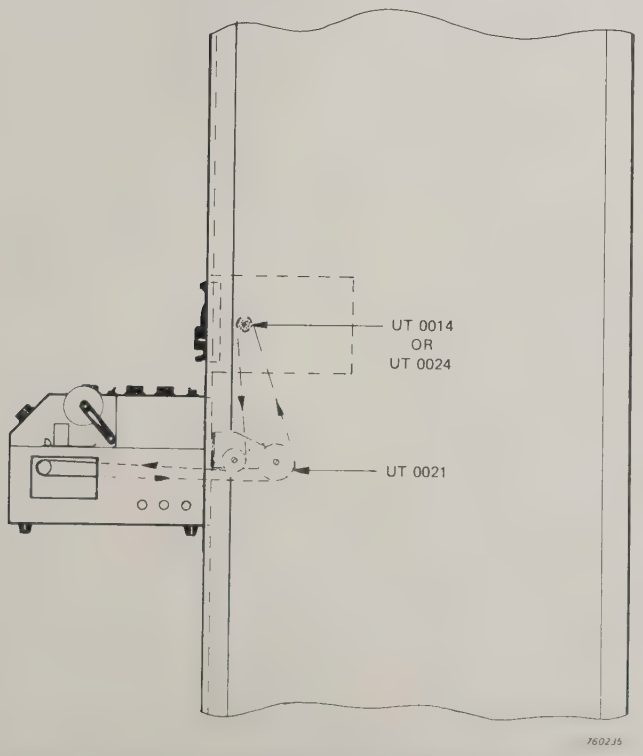


Fig.5.8. Typical instrument set-up showing chain path

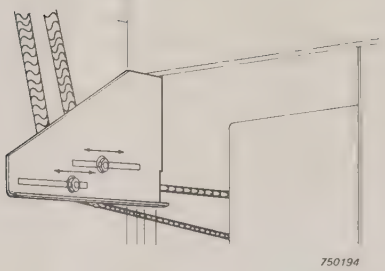


Fig.5.9. Tightening the chain

7. Follow items 7 and 8 of section 4.8.

8. Replace the drive-shaft cover plate on the Level Recorder side panel.

Note: The chain guides UT 0017 (2305) and UT 0023 (2307) supplied in kits UA 0439 and UA 0440 respectively were originally intended for use with the older rack systems, and are not normally required with the 19-inch rack. However, if there is a particularly long distance between the drive sprocket and the driven sprocket, it

Flange Set	Mounting Bolts	Washers and Spacers	Flanges
KS 0014	4 x YS 0459	4 x YJ 0380 2 x XB 0198 2 x XP 0020	2 x GV 0646
KS 0019	6 x YQ 0096	6 x YO 0439	2 x GV 0833
KS 0020	8 x YQ 0093	8 x YO 0421	2 x GV 0887
KS 0022	4 x YQ 8087	–	2 x GV 1037
KS 0023	4 x YX 3488	–	2 x GV 1171 4 x DZ 9071 8 x YN 0093
KS 0024	4 x YX 3488	–	2 x GV 0954 4 x DZ 9071 8 x YN 0093
KS 0027	4 x YX 3488	–	2 x GV 1170 4 x DZ 9071 8 x YN 0093
KS 0029	4 x YQ 8089	2 x XB 0256	2 x GV 1067
KS 0030	6 x YQ 0096	–	2 x GV 1014
KS 0036	4 x YX 2570	–	2 pieces
KS 0038	4 x YQ 8089	4 x DP 0202	2 x GV 1341

Flange Set + Chain Sprocket	Flange Set (including bolts)	Chain Sprocket
UA 0480	KS 0023	UT 0024
UA 0481	KS 0026	UT 0024

760017

Table 5.2. Components of rack-mounting flange sets

may be found advantageous to bolt the chain guide onto a flange in a suitable position to take up the play in the chain. If two instruments must be chain driven, then the chain guide may be used to ensure that both driven sprockets are correctly engaged with the chain.

5.6. FINAL POINTS

After checking that the instruments are correctly mounted, and that the chain drive is working properly, make all the necessary adjustments on the instruments and the required connections, and install the rack as required.

5.7. PARTS LISTS

Kit No.	Frame Component		
	A	B	C
KS 0001	GU 0249	GU 0259	DV 0079
KS 0009	GV 0441*	GU 0253	GV 0441*
KS 0013	GU 0263	GU 0260	DV 0133
KS 0015	GU 0598	GU 0596	DV 0150
KS 0016	GU 0258	GU 0250	DV 0080
KS 0018	DV 0156*	GU 0600	DV 0156*

* Parts A and C are a single fabrication

750083

Table 5.3. Components of rack-mounting frame sets

Component	Quantity		Part No.
	UA 0439 for 2305	UA 0440 for 2307	
Chain (2,60 m)	1	1	DX 0030
Chain Hook (not shown in Figs.)	1	1	QA 0028
Chain Guide		1	UT 0023
Chain Tightener		1	UT 0021
Chain Guide	1		UT 0017
Chain Tightener	1		UT 0015
Sprocket Accessory Kit	1		UT 0018
Spacer Plate	1		GU 0164
Spacer Plate	1		GU 0286
Washer	4	4	YO 0616
Allen Bolt		4	YQ 0254
Bolt	4		YS 0607

760018

Table 5.4. Components of rack-mounting and chain-drive kits UA 0439 and UA 0440 for attaching Level Recorders to the 19-inch rack system

The flange-mounting sets are supplied with the following parts listed in Table 5.2 (page 41).

The components of the rack-mounting frames are listed in Table 5.3.

The components of the combined rack-mounting and chain-drive kits UA 0439 (for 2305) and UA 0440 (for 2307) are listed in Table 5.4, and shown in Figs.5.10 and 5.11 respectively.

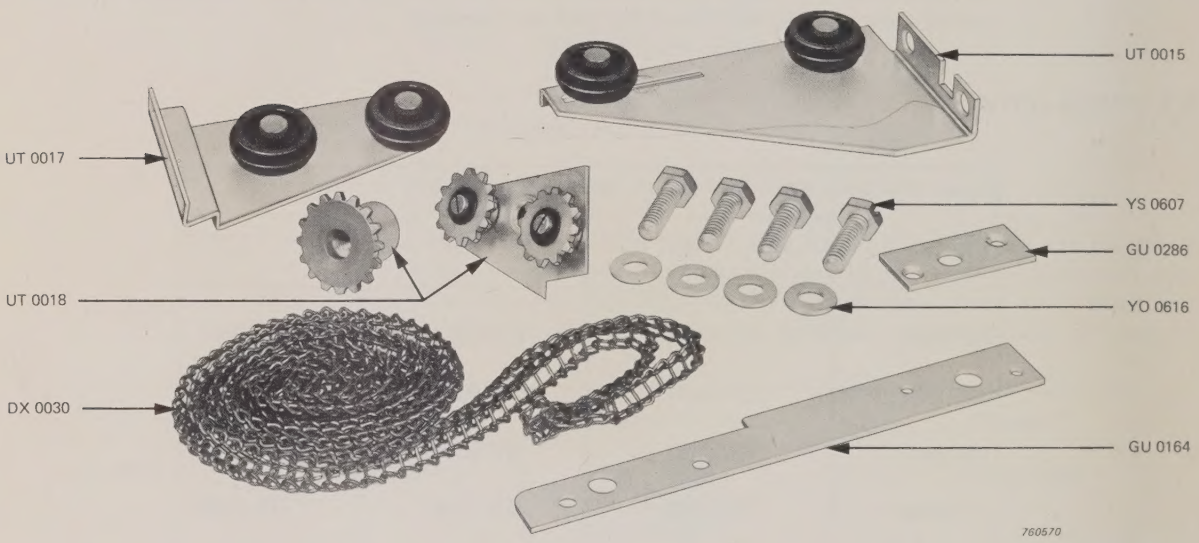


Fig.5.10. Components of rack-mounting and chain-drive kit UA 0439 for mounting 2305 onto a 19-inch rack (chain hook not shown)

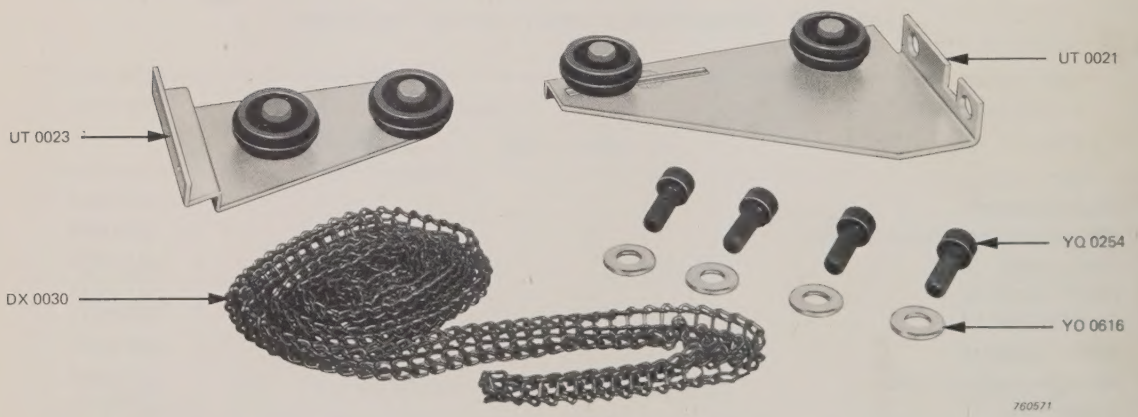
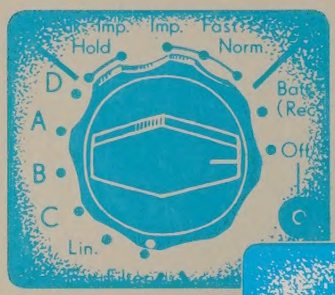
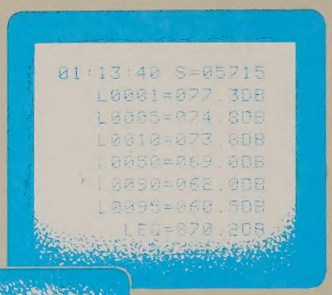
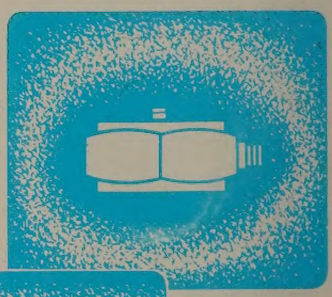
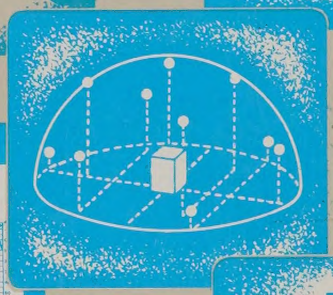


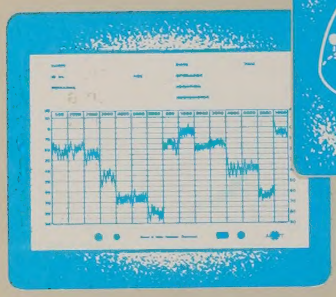
Fig.5.11. Components of rack-mounting and chain-drive kit UA 0440 for mounting 2307 onto a 19-inch rack (chain hook not shown)

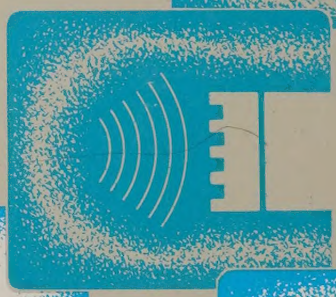


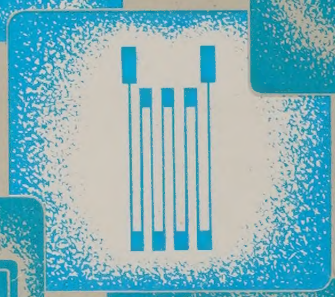


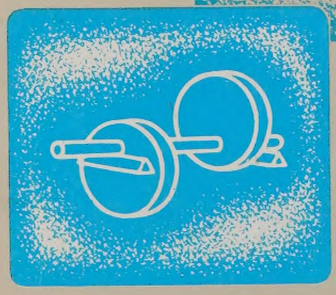


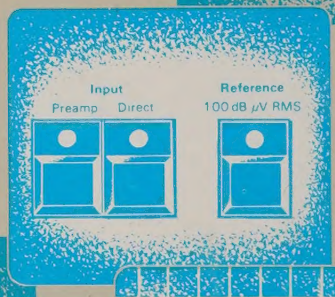


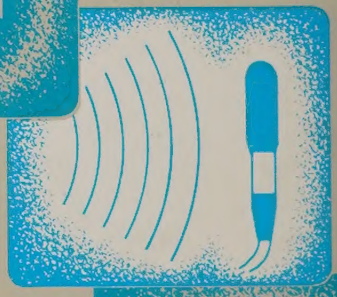


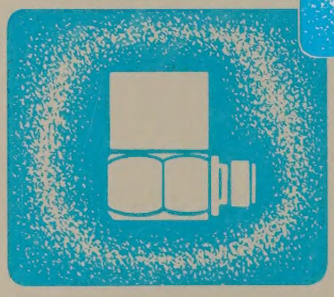


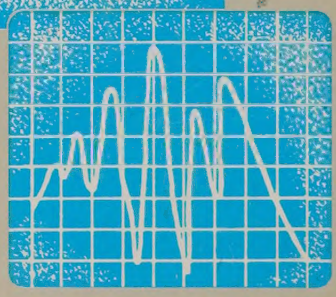


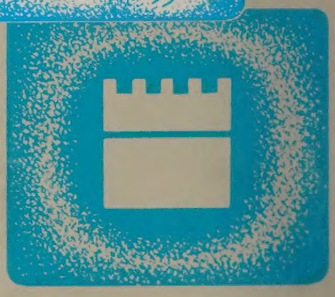












B K **Brüel & Kjær** DK-2850 NÆRUM, DENMARK · Telephone: + 452800500 · Telex: 37316 bruka dk

Printed in Denmark by Nærum Offset